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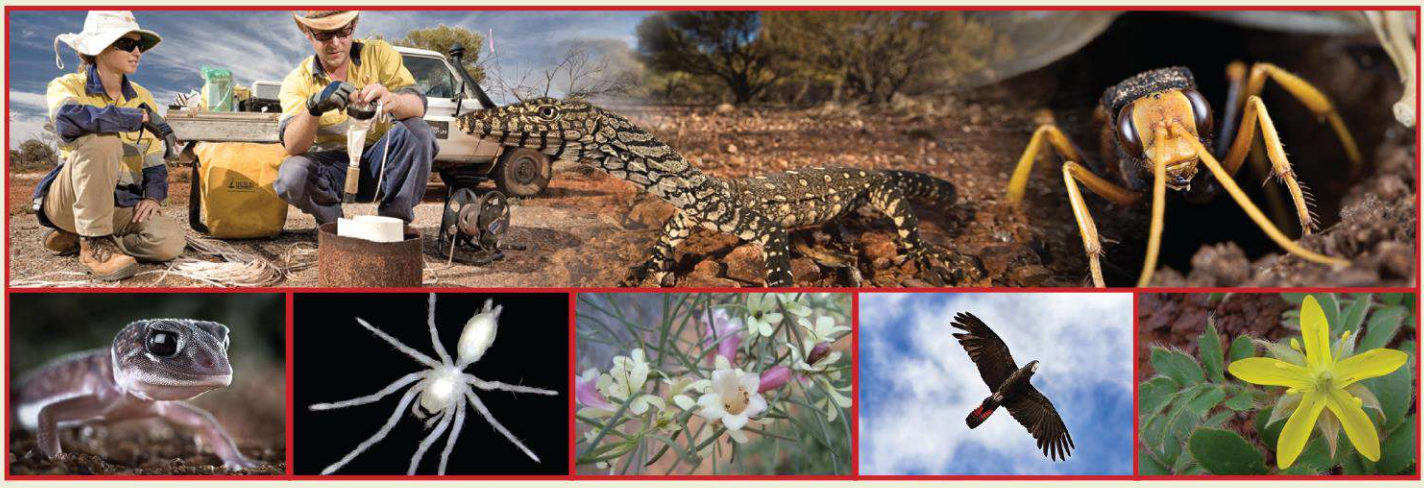
Detailed terrestrial fauna survey for the Port Hedland Green Steel Project

Prepared for Port Hedland Green Steel Pty Ltd

August 2023

Draft



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Version history

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EXECUTIVE SUMMARY

Port Hedland Green Steel Pty Ltd (PHGS) is progressing the development of large-scale downstream iron ore processing capability known as the Port Hedland Green Steel Project (the Project), located approximately 15 km southwest of Port Hedland, Western Australia (WA; Figure 1-1). PHGS intend to seek approval under Part IV of the Environmental Protection Act 1986 (EP Act) to enable development of the Project which will consist of a pellet plant and a hot briquette iron (HBI) Plant, consuming approximately 3-3.5 million tonnes per annum (Mtpa) of iron ore. In February 2023, Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by Preston Consulting to undertake a Detailed terrestrial fauna survey for the Project.

The detailed terrestrial fauna survey was undertaken in Autumn from the 17-30 April 2023. The purpose of the survey was to define the fauna values of the study area to inform Project planning and environmental impact assessment processes. The survey scope involved undertaking a detailed fauna survey to collect comprehensive, quantitative data on species, assemblages and habitats in the study area, and additionally a targeted fauna survey based on the findings of a preliminary desktop review. The targeted survey included determining the presence/absence of significant fauna identified in the desktop review as previously recorded (Bilby and Mulgara) or likely to occur in the study area and describe and map habitats or features that are important to significant fauna.

Three broad fauna habitat types were identified in the study area, comprising of sandplains, open woodlands and drainage lines. Sandplains dominate the majority of the study area, accounting for over 95%. Open woodlands comprised of less than 1% of the study area (0.9%) and drainage lines too comprised less than 1% (0.6% of the study area.

A total of 58 survey sites were sampled including 6 systematic survey sites, 25 2 ha Bilby plots, 7 Bilby transects (BT) and 20 additional opportunistic/reference/targeted survey sites. A total of 103 terrestrial vertebrate species representing 44 families and 79 genera were recorded in the study area during the field surveys. The assemblage included 101 native species and 2 introduced species.

The survey conditions were optimal for an Autumn season survey with no disturbances effecting the results.

A total of 5 significant vertebrate species comprising of 2 Threatened, one Priority and 2 Migratory listed species were recorded in the study area. These included: Greater Bilby (Vulnerable; EPBC and BC Acts), Grey Falcon (Vulnerable; EPBC and BC Acts), Brush-tailed Mulgara (Priority 4; DBCA Priority list), Fork-tailed Swift (Migratory; EPBC and BC Acts) and Osprey (Migratory; EPBC and BC Acts).

The most import result of the survey was the 128 records of Bilby sign, comprising 32 old diggings, 69 old scats, 12 recent diggings 15 recent scats bottom left photo. However, despite both intensive and extensive targeted survey effort, no Bilby burrows (old, recently active, or active burrows) were detected within the study area.

While the study area clearly forms part of a local population's large, moving home range, the absence of track sequences (indicative of current or very recent Bilby activity) within the study area, particularly the area near the northern boundary where the most recent evidence was recorded, may suggest that they have dispersed elsewhere, outside of the study area. Nevertheless, whether the local Bilby population is currently occupying the study area or not, it is very likely to return given that it has been recorded on multiple occasions across years (albeit via secondary evidence; Phoenix, 2022b). Considering this, pre-clearance surveys are recommended prior to clearing of native vegetation within the study area to ensure no active burrows are directly impacted by the Project.

The Brush-tailed Mulgara was also recorded in the study area from 2 active or recently active burrows. It is recommended that prior to any clearing activities within the study area the pre-clearance surveys are conducted for burrows of the species concurrently pre-clearance searches for Bilby.

A breeding pair and recently fledged juvenile Grey Falcon were recorded perched next to a nest on a transmission tower adjacent to the Alinta Energy Power Station at the western extent of the study

area are unlikely to be impacted by Project related disturbances given the species large foraging home range of which the study area represents only a fraction.

The 2 Migratory listed bird species, Fork-tailed swift and Osprey, while recorded in the study area, are not relevant to the habitats present. Fork tailed swifts are an almost exclusively aerial species and are therefore not limited by the availability of specific terrestrial habitats. Ospreys are a predominantly coastal species but also forage in mangroves and other large water bodies where they prey on large fish. Therefore, development of the Project, including clearing of native vegetation within the study area poses no threats to these species.

With respect to short-range endemic invertebrates, whilst the open woodland habitat seems locally isolated, it does extend eastward outside the study area and connects to larger open woodlands along drainage lines. This habitat type is well represented in the local area and within the Roebourne subregion, and as such is considered low value SRE habitat.

The SRE fauna of the region is well understood with several confirmed SRE species known in the area and a high number of records from several different SRE groups. The desktop review identified 7 confirmed SRE taxa and 78 potential SRE taxa from within the SRE desktop search area. Of these most were recorded in habitat types that aren't present in the study area, except for one record of Mygalomorph. This record was located approximately 165m from the southeastern boundary of the study area. During the field survey two mygalomorph specimens were collected that could not be identified as the sequencing failed. These records are cautiously determined potential SRE species.

Overall, the study area comprises extensive and mostly continuous low value SRE habitat. No confirmed SRE species were recorded within the study area, and it is unlikely any of the recorded potential SRE's are restricted to the study area.

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1 INTRODUCTION

Port Hedland Green Steel Pty Ltd (PHGS) is progressing the development of large-scale downstream iron ore processing capability known as the Port Hedland Green Steel Project (the Project), located approximately 15 km southwest of Port Hedland, Western Australia (WA; Figure 1-1). PHGS intend to seek approval under Part IV of the Environmental Protection Act 1986 (EP Act) to enable development of the Project which will consist of a pellet plant and a hot briquette iron (HBI) Plant, consuming approximately 3-3.5 million tonnes per annum (Mtpa) of iron ore.

In February 2023, Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by PHGS to undertake a Detailed terrestrial fauna survey for the Project.

The purpose of the survey was to define the fauna values of the study area to inform Project planning and environmental impact assessment processes.

1.1 SCOPE OF WORK

The scope of work for the Detailed terrestrial fauna survey was as follows:

- Desktop study:
    - gather contextual information on the potential terrestrial fauna and fauna habitats of the study area.
    - identify significance fauna that potentially occur in the study area.
- Detailed survey:
    - collect comprehensive, quantitative data on species, assemblages and habitats in the study area.
- Targeted survey:
    - determine the presence/absence of one or more significant species identified in the desktop review as likely to occur in the study area, including (but not limited to) Mulgara and Greater Bilby
    - determine distribution and abundance (where possible) of specific significant species.
    - describe and map habitats or features that are important to significant fauna or faunal assemblages, such as for breeding, foraging or dispersal.
- Stand-alone technical report suitable for inclusion in environmental approval documentation.

1.2 STUDY AREA

The study area is located in the Shire of Port Hedland and the Eremaean Climatic Province as defined by EPA (2020). It is approximately 1,476.3 ha and includes 4 corridors with the western-most corridor located adjacent to the Port Hedland power station (Figure 1-1). The primary disturbance footprint is located between the Roy Hill rail, Southwest Creek and the old BHP HBI plant site to the north; no disturbance is proposed south of the Great Northern Highway.

Preston Consulting
Boodarie Industrial Estate

Project No	1557
Date	29/05/2023
Drawn by	FK
Map author	JA

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Kilometers

1:1,419,800 (at A4) GDA 1994 MGA Zone 50

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- Study area
- Phoenix (2022) targeted Bilby survey
- Phoenix (2021) detailed fauna survey
- Environmentally sensitive areas
- Lakes
- DBCA managed land

Figure 1-1

Project location and study area

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2 LEGISLATIVE CONTEXT

The protection of fauna in WA is principally governed by three acts:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- State *Biodiversity Conservation Act 2016* (BC Act)
- State *Environmental Protection Act 1986* (EP Act).

The BC Act came into full effect on 1 January 2019 and replaced the functions of the *Wildlife Conservation Act 1950* (WC Act).

2.1 COMMONWEALTH

The EPBC Act is administered by the Federal Department of Climate Change, Energy, the Environment and Water (DCCEEW). The EPBC Act provides for the listing of Threatened fauna as matters of National Environmental Significance (NES). Under the EPBC Act, actions that have, or are likely to have, a significant impact on a matter of NES, require approval from the Australian Government Minister for the Environment through a formal referral process. Key threats and habitat critical to the survival of EPBC Act Threatened species are usually defined in the conservation advice and/or recovery plan for the species.

Conservation categories applicable to fauna species under the EPBC Act are as follows:

- Extinct (EX)[1] – there is no reasonable doubt that the last individual has died
- Extinct in the Wild (EW) – taxa known to survive only in captivity
- Critically Endangered (CR) – taxa facing an extremely high risk of extinction in the wild in the immediate future
- Endangered (EN) – taxa facing a very high risk of extinction in the wild in the near future
- Vulnerable (VU) – taxa facing a high risk of extinction in the wild in the medium-term
- Conservation Dependent (CD)[1] – taxa whose survival depends upon ongoing conservation measures; without these measures, a conservation dependent taxon would be classified as Vulnerable, Endangered or Critically Endangered.

The EPBC Act is also the enabling legislation for protection of Migratory species as matters of NES under several international agreements:

- Japan-Australia Migratory Bird Agreement (JAMBA)
- China-Australia Migratory Bird Agreement (CAMBA)
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn)
- Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

[1] Species listed as Extinct and Conservation Dependent are not matters of NES and therefore do not trigger the EPBC Act.

2.2 STATE

2.2.1 Threatened and Priority species

In WA, the BC Act provides for the listing of Threatened fauna species (Government of Western Australia 2018a, b)[2] in the following categories:

- Critically Endangered (CR) – species facing an extremely high risk of extinction in the wild in the immediate future[3]
- Endangered (EN) – species facing a very high risk of extinction in the wild in the near future[3]
- Vulnerable (VU) – species facing a high risk of extinction in the wild in the medium term future[3].

Species may also be listed as specially protected (SP) under the BC Act in one or more of the following categories:

- species of special conservation interest (conservation dependent fauna, CD) – species with a naturally low population, restricted natural range, of special interest to science, or subject to or recovering from a significant population decline or reduction in natural range
- migratory species (Mig.), including birds subject to international agreement
- species otherwise in need of special protection (OS).

The Department of Biodiversity, Conservation and Attractions (DBCA) administers the BC Act and also maintains a non-statutory list of Priority fauna. Priority species are still considered to be of conservation significance – that is they may be Threatened – but cannot be considered for listing under the BC Act until there is adequate understanding of threat levels imposed on them. Species on the Priority fauna lists are assigned to one of four Priority (P) categories, P1 (highest) – P4 (lowest), based on level of knowledge/concern.

2.2.2 Critical habitat

Under the BC Act, habitat is eligible for listing as critical habitat if it is critical to the survival of a Threatened species or a TEC and its listing is otherwise in accordance with the ministerial guidelines.

2.2.3 Other significant fauna

Under the EPA's environmental factor guidelines, fauna may be considered significant for a range of reasons other than listing as a Threatened or Priority species.

In addition to listing as Threatened or Priority, EPA (2016a) identifies the following attributes that constitute significant fauna:

- species with restricted distribution (see also section 2.2.4)
- species subject to a degree of historical impact from threatening processes
- providing an important function required to maintain the ecological integrity of a significant ecosystem.

[2] The *Wildlife Conservation (Specially Protected Fauna) Notice 2018* and the *Wildlife Conservation (Rare Flora) Notice 2018* have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018* to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the BC Act.

[3] As determined in accordance with criteria set out in the ministerial guidelines.

Provided in the guide for assessment of applications to clear native vegetation (DER 2014) is a scale for assessing the bioregional conservation status of ecological vegetation classes (**Error! Reference source not found.**).

2.2.4 Short-range endemic invertebrates

Short-range endemic (SRE) fauna are defined as animals that display restricted geographic distributions, nominally less than 10,000 km^2, that may also be disjunct and highly localised (Harvey 2002). EPA (2016a) identifies species with restricted distributions as being significant fauna in the context of environmental impact assessments (EIA). SRE fauna need to be considered in EIA as localised, small populations of species that are generally at greater risk of changes in conservation status due to environmental change than other, more widely distributed taxa.

Short-range endemism in terrestrial invertebrates is believed to have evolved through two primary processes (Harvey 2002):

- Relictual – where the drying climate reduced the area of suitable habitat available to a species, forcing a range contraction. Such habitats typically maintain historic mesic conditions (e.g. south-facing rock faces or slopes of mountains or gullies).
- Habitat speciality – where species settled in particular isolated habitat types (e.g. rocky outcrops) by means of dispersal and evolved in isolation into distinct species.

SRE invertebrates have however also been reported in more widespread habitats such as spinifex plains or woodlands, mainly in groups with low dispersal capabilities, for example mygalomorph spiders and millipedes (see for example Car & Harvey 2014; Rix et al. 2018).

There can be uncertainty in categorising a specimen as an SRE due to several factors including poor regional survey density, lack of taxonomic research and problems of identification, i.e. specimens that may represent SREs cannot be identified to species level based on the life stage. For example, in contrast to mature males, juvenile and female millipedes, mygalomorph spiders and scorpions cannot be identified to species level. Molecular techniques such as 'barcoding' (Hebert *et al.* 2003a; Hebert *et al.* 2003b) are routinely employed to overcome taxonomic or identification problems.

2.2.5 Environmentally Sensitive Areas

Under section 51B of the EP Act the Minister for Environment may declare by notice either a specified area of the State or a class of areas of the State to be Environmentally Sensitive Areas (ESAs). ESAs are declared in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*, which was gazetted on 8 April 2005 (Government of Western Australia 2005).

ESAs are areas where the vegetation has high conservation value. Several types of areas are declared ESAs including:

- the area covered by vegetation within 50 metres (m) of Threatened flora, to the extent to which the vegetation is continuous with the vegetation in which the Threatened flora is located
- the area covered by a TEC
- a defined wetland (Ramsar wetlands, conservation category wetlands and nationally important wetlands) and the area within 50 m of the wetland
- Bush Forever sites.

3 EXISTING ENVIRONMENT

3.1 INTERIM BIOGEOGRAPHIC REGIONALISATION OF AUSTRALIA

The Interim Biogeographic Regionalisation of Australia (IBRA) classifies Australia's landscapes into large 'bioregions' and 'subregions' based on climate, geology, landform, native vegetation and species information (DoEE 2016). The study area is located in the Roebourne subregion (PIL4) of the Pilbara bioregion (Figure 3-1) which is characterised as (Kendrick & Stanley 2001):

> "Quaternary alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera*. Uplands are dominated by *Triodia* hummock grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, *Sporobolus* and mangal occur on marine alluvial flats and river deltas."

3.2 LAND SYSTEMS AND SURFACE GEOLOGY

The Department of Primary Industries and Regional Development (DPIRD) undertakes land system mapping for WA using a nesting soil-landscape mapping hierarchy (Schoknecht & Payne 2011). While the primary purpose of the mapping is to inform pastoral and agricultural land capability, it is also useful for informing biological assessments. Under this hierarchy, land systems are defined as areas with recurring patterns of landforms, soils, vegetation and drainage (Payne & Leighton 2004).

The study area intersects 2 land systems (Table 3-1; Figure 3-2). Most of the study area comprises the Uaroo system with a hiatus in the northeast corridor representing the Littoral system.

Table 3-1 Land systems and extent in study area

Land system	Description	Area (ha)	% of study area
Uaroo System	Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs.	1,474.0	99.8
Littoral System	Bare coastal mudflats (unvegetated), samphire flats, sandy islands, coastal dunes and beaches, supporting samphire low shrublands, sparse acacia shrublands and mangrove forests.	2.3	0.2
Total		**1,476.3**	**100.0**

According to the Surface Geology of Australia 1:1,000,000 scale, WA database (Stewart et al. 2008), the study area intersects one geological formation representing alluvium 38485 (Table 3-2; Figure 3-2).

Table 3-2 Surface geology of the study area, extent by deposit type

Surface geology	Abbreviation	Description	Area (ha)	% of study area
alluvium 38485	Qa	Channel and flood plain alluvium; gravel, sand, silt, clay, locally calcreted	1,476.3	100.0
Total			**1,476.3**	**100.0**

Western Australia

PERTH

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Date	29/05/2023
Drawn by	FK
Map author	JA

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Kilometers

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Land systems

- Littoral System
- Mallina System
- River System
- Uaroo System
- Yamerina System

Figure 3-2

Land systems and surface geology in the study area

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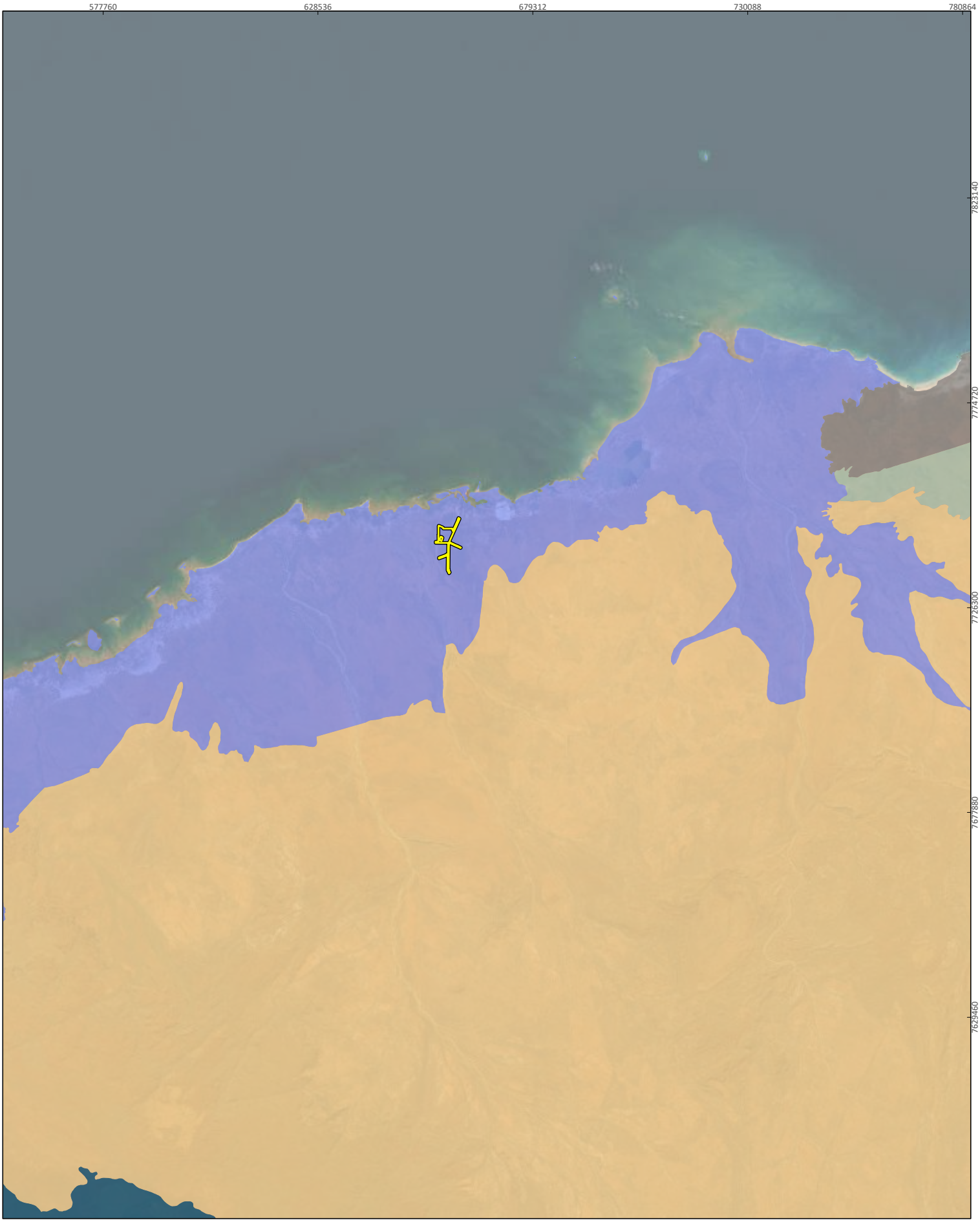

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Region, subregion

- Dampierland,Pindanland
- Great Sandy Desert,McLarty
- Pilbara,Chichester
- Pilbara,Fortescue
- Pilbara,Roebourne

Figure 3-1

Study area in relation to IBRA bioregions and subregions

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3.3 CLIMATE AND WEATHER

The climate of the Roebourne subregion is described as arid (semi-desert) tropical with highly variable rainfall, falling mainly in summer (Kendrick & Stanley 2001). The nearest Bureau of Meteorology (BoM) weather station with comprehensive data collection and recent historic climate data is Port Hedland Airport (no. 004032), Latitude: 20.37°S Longitude 118.63°E, located approximately 11 km north-east of the study area.

Port Hedland Airport records the highest mean maximum monthly temperature (36.8°C) in December and March (lowest in July, 27.4°C) and the lowest minimum mean monthly temperature (12.5°C) in July (highest in January, 25.7°C) (BoM 2023) (Figure 3-3). Median annual rainfall is 310.6 mm with January and February recording the highest monthly median (25.6 and 71.2 mm respectively; Figure 3-3). Cyclonic activity is significant with several systems affecting the coast and hinterland annually (Kendrick & Stanley 2001). Prior to commencement of the survey, Cyclone Ilsa (Category 5) threatened the town of Port Hedland; however, local precipitation and damage was negligible.

Daily mean temperatures at Port Hedland Airport in the 3 months preceding the surveys were on average consistent with the long-term averages for the region (Figure 3-3). The average mean maximum and minimum temperatures were 0.3°C and 1.3°C warmer than the long-term averages, respectively. Daily maximum temperatures during the survey ranged from 31.7°C to 34.9°C, and daily minimum temperatures from 15.6°C to 25.4°C (Appendix 6)

Records from Port Hedland Airport show a total of 22.5 mm (19.8 %) more local precipitation was recorded in the 3 months leading up to the survey compared to the long-term averages for the region; local precipitation was almost identical to the long-term median, with 3.8 mm more (314.4 mm) recorded in the 12 months preceding the survey. No rainfall was recorded during the survey (Appendix 6).

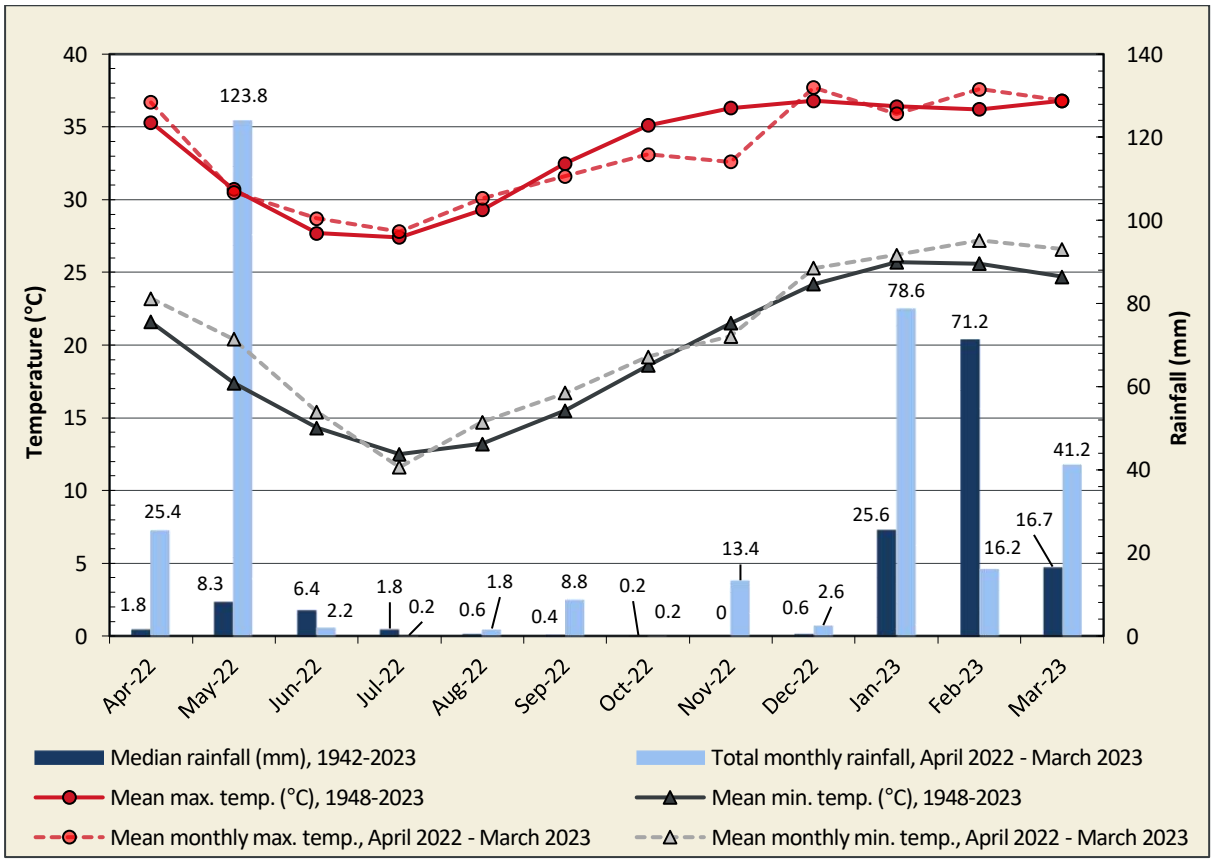


Figure 3-3 **Annual climate and weather data for Port Hedland Airport (no. 004032) and mean monthly data for the 12 months preceding the survey (BoM 2023)**

3.4 LAND USE

The dominant land use of the PIL4 subregion comprises grazing (native pastures), Aboriginal lands and reserves, conservation, mining leases and urban development (Kendrick & Stanley 2001). As per land use summaries extracted from the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES 2018) and summarised in Table 3-3, 'production from relatively natural environments' and 'conservation and natural environments' are the dominant land use components comprising the PIL4 subregion. Land use across the study area is subject to similar usages (and proportional area) to the PIL4 subregion; the dominant secondary components represent 'grazing native vegetation' (1,008.5 ha, 68.3%) and 'other minimal uses' (461.1 ha, 31.2%), which does not have any formal environmental protection. The Port Hedland and South Hedland power stations and a pipe stockyard are situated adjacent to the study area to the east.

Table 3-3 Land use of the study area, according to ABARES (2018)

Land use	PIL4 subregion		Study area	
	Area (ha)	% of PIL4	Area (ha)	% of study area
Conservation and natural environments	492,279.8	26.5	461.1	31.2
Intensive uses	8,481.1	0.5	4.2	0.3
Production from dryland agriculture and plantations	367.7	<0.01	-	-
Production from irrigated agriculture and plantations	0.4	<0.01	-	-
Production from relatively natural environments	1,302,639.7	70.1	1,008.7	68.3
Water	54,528.3	2.9	2.3	0.2
Total	**1,858,297.0**	**100.0**	**1,476.3**	**100.0**

3.5 CONSERVATION RESERVES AND ESAS

No conservation reserves intersect the study area or occur within the 40 km desktop search extent. The nearest conservation reserves are Mungaroona Range Nature Reserve and Eighty Mile Beach Marine Park, located approximately 101 km south-southwest and 110 km north-west from the study area boundary, respectively (Figure 1-1). No DBCA lands of interest proposed for conservation occur near the study area. A total of 7 ESAs occur within the desktop search extent (Figure 1-1; Table 3-4); 2 small ESAs (IDs 15126 and 15128) are occur nearby, located approximately 8 and 10.7 km north-northwest and north-northeast of the study area, respectively. A larger ESA is located approximately 18.7 km north-east of the study area, encompassing salt evaporator ponds and the surrounding tidal mudflats. This system of evaporation ponds and adjacent mudflats is classified as an Important Bird Area (IBA) due to its global importance for bird populations, particularly Red-necked Stints and Sharp-tailed Sandpipers (Birdlife International 2022) (Figure 1-1).

Table 3-4 ESAs in the desktop search extent

Identity	Area (ha)	Distance to study area
12070	36.4	34.2 km NE
12071	32.3	39.4 km NE
12074	206.0	36.8 km NE
12075	19,732.6	18.7 km NE
15126	7.8	8.0 km NNW
15127	36.1	8.0 km N
15128	1.5	10.7 km NNE

4 METHODS

The detailed terrestrial fauna survey was conducted in accordance with relevant survey guidelines and guidance, including:

- *EPA Technical Guidance: Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020)
- *EPA Technical Guidance: Sampling of short range endemic invertebrate fauna* (EPA 2016c)
- *Guideline for survey and relocation of Bilby in WA* (DBCA 2018)
- *Interim guideline for preliminary surveys of Night Parrot (Pezoporus occidentalis) in WA* (DPaW 2017).

4.1 DESKTOP REVIEW

Searches of several biological databases were undertaken to identify and prepare lists of significant fauna that may occur within the study area (Table 4-1). A literature search was conducted for accessible reports for biological surveys conducted within 40 km of the study area to build on the lists developed from the database searches (Table 4-2).

Table 4-1 Database searches conducted for the desktop review

Database	Target group/s	Search coordinates and extent
Protected Matters Search Tool (DCCEEW 2022)	EPBC Act Threatened fauna	Study area plus a 40 km buffer
DBCA Threatened and Priority Fauna Database (DBCA 2022b)	Threatened and Priority fauna	Study area plus a 40 km buffer
DBCA NatureMap Database (DBCA 2022a)	Fauna records	Study area plus a 40 km buffer
WA Museum Arachnid and Myriapod Database, Mollusca Database (WAM 2022)	Arachnid, myriapod and mollusc SREs	100 km^2 search area encompassing the study area between 19.5269°S, 117.5647°E (northwest corner) and 21.3154°S, 119.4991°E (southeast corner)

Table 4-2 Survey reports included in the desktop review

Report author	Survey description	Project
Bennelongia (2011)	Migratory shorebird survey	Outer Harbour Development
ENV (2009)	Terrestrial fauna surveys	Outer Harbour Development
Phoenix (2022a)	Basic vertebrate fauna survey	Port Hedland Source Planning
Phoenix (2022b)	Detailed terrestrial fauna and targeted Bilby survey	Port Hedland Solar Farm
ENV (2011)	Basic and targeted terrestrial fauna surveys	Port Hedland Regional Assessment
ENV and Phoenix (2009)	Level 2 short-range endemic invertebrate survey	Outer Harbour Development and Goldsworthy Rail Duplication

4.2 FIELD SURVEY

4.2.1 Survey timing

The survey was undertaken in Autumn from the 17-30 April 2023.

4.2.2 Terrestrial fauna

Field methods for the fauna survey of the study area included:

- habitat assessment and mapping (see 4.2.2.1)
- systematic trapping (4.2.2.2)
- active diurnal and nocturnal searches (4.2.2.3)
- avifauna surveys (4.2.2.4)
- bat echolocation recordings (4.2.2.5)
- camera trapping (4.2.2.6)
- targeted surveys for Greater Bilby (4.2.2.7; *Macrotis lagotis*, VU)
- SRE invertebrate sampling (4.2.2.9)

A total of 58 survey sites were sampled (Figure 4-1; Appendix 1); these included 6 systematic survey sites, 25 Bilby plots (BP), 7 Bilby transects (BT) and 20 additional opportunistic/reference/targeted sites.

4.2.2.1 Habitat assessment and mapping

Initial habitat characterisation was undertaken using various remote geographical tools, including aerial photography (Google Earth®), land system maps and topographic maps. Habitats with the potential to support significant terrestrial fauna species were identified based on known habitats of such species within the Pilbara bioregion. Tentative sites were selected for the terrestrial fauna survey to represent all habitat types. Final survey site selection was conducted after ground-truthing of site characteristics.

At the broadest scale, site selection considered aspect, topography and land systems. At the finer scale, consideration was given to proximity to water bodies (drainage lines and creek), vegetation complexes and condition and soil type. Sites were primarily chosen to represent the best example of distinct habitats within the broader habitat associations of the study area with a focus on species of conservation significance identified in the desktop review. Two replicates per habitat type were selected for Level 2 systematic sampling. Habitat descriptions and characteristics were recorded at all Level 2 systematic survey sites (Figure 4-1; Table 4-3; Appendix 2).

To more accurate define and delineate the fauna habitats in the study area, photographs were taken while traversing the study area (Figure 4-1) with a focus on transitions between fauna habitats (ecotones) apparent from aerial imagery. All photographs were geolocated and spatially mapped to reference. Photographs were used in conjunction with survey site descriptions and regional land system descriptions (Schoknecht & Payne 2011) to map the fauna habitats of the study area.

Table 4-3 Terrestrial fauna survey effort

Site	Site type	Habitat assessment (#)	Diurnal active searches (hours)	Nocturnal active searches (hours)	Birding (hours)	Ultrasonic recording (nights)	Acoustic recorder (nights)	Camera trap (trap-nights)	Bucket (trap-nights)	Aluminium box (trap-nights)	Funnel (trap-nights)	Pipe (trap-nights)	Bilby 2 ha plot (#)	Bilby transect (#)	Opp sighting (#)	SRE foraging (hours)	Litter sieve (#)
BIE001	FS	1	0.7	4	1.3	4	6		35	70	140	35			4	0.3	
BIE002	FS	1	0.3	4	1.0	6	8		35	70	140	35				0.3	
BIE003	FS	1	1.0	3	1.0				35	70	140	35			4	0.3	
BIE004	FS	1	1.0	4	1.0	(3)	3		35	70	140	35			1	0.3	
BIE005	FS	1	0.7	3	0.7	4			35	70	140	35			4	0.3	3
BIE006	FS	1	6.3	3	3.0	4		20	35	70	140	35			3	0.3	3
BIE007	FS		0.7		0.7												
BIE008	FS		0.7		0.7												
BIE009	TFS									1							
BIE010	TFS									20							
BP001-025	TFS												25				
BT001-007	TFS													18			
Opp001-016	FS														22		
Total		**6**	**11.3**	**21.0**	**9.3**	**21**	**17**	**20**	**210**	**441**	**840**	**210**	**25**	**18**	**38**	**1.8**	**6**

Rows highlighted in grey are systematic sites. Values in parentheses indicate intended survey effort in the absence of device malfunction. TFS = Targeted fauna site; FS = Fauna site; SP = Site photo; BT = Bilby transect; BP = Bilby plot.

4.2.2.2 Systematic trapping

Six systematic trapping sites were established to capture terrestrial mammals, reptiles and amphibians (Figure 4-1). Each site comprised 5 'sub-sites' which consisted of 2 dry pitfall traps including one PVC pipe (15 cm diameter x 60 cm depth) and one 20 L bucket, 4 funnel traps (75 cm x 18 cm x 18 cm) and 2 aluminium box traps (9 cm x 10 cm x 33 cm). The pipes and buckets were installed flush with the substrate, with a 10 m long, 30 cm high aluminium drift fence bisecting each pit. Funnel traps were positioned at the start and finish of each drift fence, and one on either side of the drift fence in the centre between pitfall traps. Aluminium box traps were place in vegetation adjacent to the trap line. Sub-sites were positioned approximately 20 m apart along a 100 m transect.

The aluminium box traps were baited with a universal bait mixture consisting of oats, peanut butter and sardines to attract small mammals. Aluminium box and funnel traps were shrouded with reflective closed cell insulation (R2.5 rated) to provide shade and protection for any captured animals. All traps were given as much shade as possible under/around vegetation. Reflective closed cell insulation (R2.5 rated) and leaf litter were used to provide protection from the elements in the bottom of all buckets.

Traps were open for 7 consecutive nights and checked within 3 hours of sunrise. Baits were removed and replaced every second day.

The total vertebrate trapping effort for the 6 systematic trapping sites during the surveys was 1,608 trap-nights (Table 4-3), where a trap-night is defined as one trap remaining open for one night.

4.2.2.3 Active diurnal and nocturnal searches

Active searches were undertaken at each systematic and 2 additional sites throughout the study area (Figure 4-1). Active searches primarily targeted diurnal herpetofauna and mammals from direct sightings and secondary evidence. Searches focused primarily on significant species identified in the desktop review as potentially occurring within the study area, including Brush tailed Mulgara (*Dasycercus blythi*, P4) and Greater Bilby (*Macrotis lagotis*, VU).

Searches were undertaken in any observable microhabitats considered likely to support mammals, reptiles and amphibians. Techniques included: raking leaf and bark litter, overturning logs, searching beneath the bark of trees, investigating dead trees and logs, investigating burrows and identifying any secondary evidence including tracks, diggings, scats, fur or sloughs (shed skins), predation or feeding sites, and fauna constructed structures such as nests. Between 0.7 to 6.3 person hours was spent active searching at each site for a total of 11.3 hours over the duration of the field survey (Table 4-3).

Nocturnal searches were undertaken at each systematic site to detect the presence of any nocturnal fauna species. Nocturnal searches were undertaken between sunset and 9 pm when activity levels were highest for most nocturnal species. Searches consisted of using head torches to detect animal movement, eye shine, or other evidence of fauna presence. These searches particularly targeted reptiles and mammals, but also nocturnal birds. Approximately 21 person-hours of nocturnal searches were undertaken during the field surveys (Table 4-3).

4.2.2.4 Avifauna surveys

Twenty-minute avifauna surveys were undertaken at each of systematic site and 2 additional sites (Figure 4-1; Table 4-3). Avifauna surveys were confined to the habitat type (up to 2 ha) represented by each site to collect assemblage data for each habitat. Avifauna surveys were undertaken throughout the day with a focus on periods of higher activity around sunrise and sunset. Surveys consisted of bird recordings from visual sightings and call recognition. Between 0.7 to 3.0 person hours was spent of avifauna census at each site for total of 9.3 hours over the during the field survey (Table 4-3).

Additional avifauna observations were also recorded opportunistically while other field work was being completed, including observations made during travel and active searches.

SongMeter SM4 recording devices were deployed at 3 sites for between 3 to 8 nights to target Night Parrot (*Pezoporus occidentalis*, CR; Table 4-3) in accordance with survey guidelines (DPaW 2017). The Song Meters were deployed at systematic sites in locations considered potential roost habitat for Night Parrot and set to record continuously over the deployment period.

The significant migratory and non-migratory avifauna assemblage identified in the desktop review as potentially occurring was taken into consideration when undertaking systematic avifauna surveys and traversing the study area.

4.2.2.5 Bat echolocation recordings

Song Meter SM4 recording devices were used to record bat echolocation calls at 5 sites during the field survey (Table 4-3, Figure 4-1); one Song Meter device malfunctioned during the field survey and therefore no data was recorded from BIE004. Recording devices were deployed at each site for a minimum of 4 nights of recording for between 8 and 12 continuous hours per night (Table 4-3). Devices were aimed at a 45° angle to the ground. The Song Meters were positioned in areas of habitat likely to have increased insect activity and to attract bats (i.e. likely foraging areas or movement corridors) and/or potential roosting sites where possible.

4.2.2.6 Camera trapping

Four motion-sensitive camera traps baited with universal bait were deployed for 5 nights at BIE006 to gather broad fauna assemblage data outside of disturbance periods (Table 4-3). Cameras were deployed for a total of 20 camera trap-nights. Cameras were set to take 3 rapid-fire images with one second intervals and a 5 second video with a 15 second trigger interval. Camera sensitivity was set to high.

4.2.2.7 Targeted surveys for Bilby (*Macrotis lagotis*, VU)

The objective of the targeted Bilby survey was to determine their presence/absence from the study area and identify areas of recent activity by adopting survey methods detailed in DBCA (2018). Bilby populations are known to have moving home ranges (Dziminski *et al.* 2020). Detection of secondary evidence including scats, tracks, burrows and diggings is the most reliable technique to determine whether bilbies are currently or were formerly present in an area. The occurrence of fresh scats, definitive tracks and/or multiple concentrated diggings can be indicative of current presence; unclear tracks, burrows and diggings in the open can indicate potential activity but cannot alone be used to verify current presence.

A combination of linear transects and 2 ha sign plots were undertaken to provide extensive and representative coverage in all suitable habitat types across a large study area that varies considerably in shape. It is recommended for 2-4 plots be searches per 100 ha, with plot spacing increasing with the size of the study area (DBCA 2018). By combining these methods, there is an increase in confidence in detecting the presence of Bilby in a given area (DBCA 2018).

Linear transects were searched with ~20 m spacing in the study area corridors where suitable habitat was located (Figure 4-2). A total of 18 transects were traversed on foot to detect Bilby presence.

The standardised 2 ha sign plot method was used for the centre portion of the study area where suitable habitat was identified. The methods involved searching multiple 2 ha plots for Bilby sign, for 25 minutes. Sign plots were distributed to include all areas of suitable Bilby habitat across the study area. A total of 25 2 ha plots were searched.

All locations of secondary evidence were recorded on GPS enabled devices (Figure 5-3)

4.2.2.8 Analysis of survey completeness

Species accumulation curves were produced on a samples and abundance basis using PRIMER V6 (Clarke & Gorley 2006) to obtain an estimate of survey completeness (i.e. whether the collection adequately represents the vertebrate fauna assemblage of the study area) for systematic methods completed within the study area (overall). All sample types were aggregated per site and no data transformation was undertaken. The maximum permutations were set at 999.

4.2.2.9 SRE invertebrate sampling

Sampling for SRE invertebrates was conducted at all 6 systematic sites (Figure 4-1), including areas identified as suitable habitat for SREs. Sampling comprised the following methods:

- dry pit trapping
- active foraging
- litter/soil sieving.
- blowing for mygalomorph spiders

SRE were collected from dry pitfall traps and other systematic traps during the detailed survey of the study area.

Active foraging for SRE invertebrate groups (concurrently with active vertebrate fauna searches) comprised inspection of logs, the underside of bark of larger trees and the underside of rocks. Methodical searches were conducted amongst the leaf litter of shade-bearing tall shrubs and trees, including raking of litter.

A standardised approach was undertaken whereby each site (considered suitable SRE habitat) was sampled for 20 minutes, with a total search effort of approximately 1.8 hours (Table 4-3). Trapdoor spider burrows identified during the searches were excavated if they were considered inhabited. Spider burrows were located by visual inspection and blowing, whereby a leaf blower is used to open the lid and expose the burrow. Excavation involved removing soil from around the burrow to carefully expose the burrow chamber and remove the spider.

Combined litter/soil sifts were undertaken at 2 sites, with up to 3 sifts conducted at each site dependent on abundance of leaf litter. In total, 6 sifts were undertaken (Table 4-3). The collection of leaf litter samples was standardised volumetrically by the diameter and height (310 mm x 50 mm = 1.55 L) of the sieves which were completely filled with compressed litter and the upper layers of underlying soil. Samples were sieved through 3 stages of decreasing mesh size over a round tray and invertebrates were picked from the sieves and tray with forceps. These samples particularly targeted small spiders (Araneomorphae), pseudoscorpions, buthid scorpions, millipedes, centipedes (in particular Geophilomorpha and Cryptopidae), smaller species of molluscs (e.g. Pupillidae) and slaters.

4.2.2.10 SRE potential habitat rating

Fauna habitat mapping was assessed for its potential to support endemic SRE species and communities. Potential SRE habitat was rated as follows:

- High – defined/known areas of habitat that contain elements that often give rise to specialisation or dependency in invertebrate fauna, such as aspect (e.g. south-facing slopes, geological features (e.g. granite), soil types that retain water (e.g. clay, loam). These habitats may also include habitat isolates which have the capacity to restrict dispersal.
- Low – areas of largely in-tact native vegetation that occur broadly across the landscape, are less incised and typically link more restricted habitats. This may include land that was cleared but has since been rehabilitated or is in the process of being rehabilitated.

- None – land that has been previously cleared for other uses that no longer contains native vegetation.

4.2.2.11 SRE status rating

Currently, there is no accepted system to determine the likelihood that a species is an SRE. The WA Museum applies three categories: Confirmed, Potential, and Widespread. Confirmed SREs are taxa for which the distribution is known to be less than 10,000 km^2, the taxonomy is well known, and the group is well represented in collections and/or via comprehensive sampling (WAM 2013). Potential SREs include those taxa for which there is incomplete knowledge of taxonomy or geographic distribution, and the group is not well represented in collections. Phoenix applies four categories based on the WA Museum criteria (Table 4-4).

Table 4-4 Short-range endemic categories

SRE category	Criteria
Confirmed	Distribution <10,000 km^2. Taxonomy of the group is well known (but not necessarily published); group is well represented in collections, in particular from the region in question; high levels of endemism exist in documented species; inference is often possible from immature specimens.
Likely	Distribution < 10,000 km^2. Taxonomically poorly resolved group but group is generally well-represented in collections; unusual morphology for the group (e.g. some form of troglomorphism); often recorded as singletons in survey and few, if any, regional records.
Potential	Distribution <10,000 km^2. Taxonomically poorly resolved group; patchy distribution, often common in certain micro-habitats, but no other regional records; congeners (= species in the same genus) both widespread and restricted in distribution.
Widespread	Distribution >10,000 km^2.

4.2.2.12 SRE taxonomy

Initial higher-level (class, order, family) identifications of specimens are undertaken by Phoenix staff in Phoenix' invertebrate laboratory. Final specials designations are allocated using specialist morphological and/or molecular sequencing (Table 4-5).

Where possible identifications are on compared with reference material from the WA Museum and/or taxonomist reference collections.

Table 4-5 Specialist taxonomists

Person	Title	Taxa
Dr Erich S. Volschenk	Taxonomic consultant, Alacran	Scorpiones, Pseudoscorpiones
Dr Simon Judd	Taxonomic consultant	Isopoda
Dr Cathy Carr	Taxonomist	*Antichiropus* millipedes
Jane McRae	Taxonomist; Bennelongia	Stygofaunal amphipods, copepods, ostracods, oligochaetes, coleoptera, bathynellaceae
Anna Jacks	Invertebrate zoologist, Phoenix	Selenopidae spiders, Chilopoda, Gastropoda, Isopoda, Diplopoda

Sequences were edited and analysed using Genius 2022.2. Sequences for comparison were sourced from GenBank (Benson *et al.* 2012) and Phoenix's DNA database using the megablast search function in Geneious. For each sequence, the most similar ten matches were retrieved. In cases where the retrieved sequences represented a species more than twice, then the two longest sequences were retained and the shorter conspecific sequences discarded. Where megablast results yielded families differing from the morphological assessment, then additional sequences were obtained from GenBank, representing the morphological taxonomic assessment. If all of the resulting blast sequences represented organisms from a different taxonomic class, sequences were discarded as likely contamination.

SRE specimens collected during the survey have been lodged with the WA Museum.

4.2.2.13 Likelihood of occurrence assessment

Following the field survey, the likelihood of occurrence for each significant fauna species identified in the desktop review was assessed and assigned to one of four ratings:

- recorded – species recorded within the study area by previous or current survey
- likely – study area within current known range of species, suitable habitat within the study area and home range of species intersects study area based on known records
- possible – study area within current known range of species, suitable habitat within the study area and home range of species does not intersect study area based on known records
- unlikely – study area outside current known range of species or no suitable habitat present in study area.

4.2.3 Survey personnel

The personnel involved in the surveys are listed in Table 4-6. All survey work was carried out under relevant licences issued by DBCA under the BC Act (Table 4-6).

Table 4-6 Survey personnel

Name	Permit	Qualifications	Role/s
Simon Pynt	Fauna taking (biological assessment) licence no. BA27000780, TFA2223-0183	BSc Zoology	Project management and logistics, field survey, reporting
Jade Larkman		BSc Environmental Sciences	Field survey, desktop review
Will Purser		MSc Biological Sciences (Zoology)	Field survey, reporting
Patrick Williams		MSc Environmental Sciences	Field survey
Kerryn Fox		MSc Veterinary Science (Wildlife Health and Conservation)	Reporting
Brigitte Kovar		MSc Geographical Information Systems (GIS)	GIS

5 RESULTS

5.1 DESKTOP REVIEW

5.1.1 Vertebrate fauna

The desktop review identified records of 369 vertebrate taxa within the desktop search extent. The list comprised 12 frogs, 94 reptiles (including 2 introduced species), 218 birds (including 2 naturalised species) and 45 mammals (including 11 introduced species) (Table 5-1; Appendix 3).

Phoenix previously carried out a detailed terrestrial fauna and targeted Bilby survey in the Boodarie area (Phoenix 2022b); the detailed study area lies adjacent to the Project's eastern corridor, and the targeted Bilby survey area intersects the southern half of the study area (Figure 1-1). A total of 82 species were recorded during the detailed fauna survey, comprising 6 amphibians, 36 reptiles, 25 birds and 15 mammals (including 4 introduced species).

Table 5-1 Summary of terrestrial fauna desktop results

Class	Introduced	Native	Total
Amphibians	0	12	**12**
Reptiles	2	92	**94**
Birds	2	216	**218**
Mammals	11	34	**45**
Total	**15**	**354**	**369**

EPBC Protected Matters Search (DCCEEW 2023a) does not return species locations and includes instances where suitable habitat may occur but the species has no necessarily been observed (indicated with an asterix in Table 5-2). Sixty-five significant vertebrate species were identified in the desktop review, comprising 10 species listed as Threatened, Conservation Dependent or Specially Protected under the EPBC Act and/or BC Act, 51 avifauna species listed as Migratory under the EPBC Act and BC Act, and a further 5 species are listed as Priority by DBCA (including one locally extinct species) (Table 5-2).

Two significant vertebrate species have previously been recorded within the study area (Figure 5-1):

- Bilby, *Macrotis lagotis* (VU), recorded by DBCA (2022b); one record in the west of the study area from 1899. Over 100 records of secondary evidence were recorded by Phoenix (2022b) within and nearby the study area.
- Brush-tailed Mulgara, *Dasycercus blythi* (P4), recorded by DBCA (2022b); 3 records in the study area between 2008 and 2012. An additional 269 records occur in the wider desktop review area from 1982 to 2019.

An additional 31 significant species have been recorded within 5 km of the study area, comprising one reptile, 28 birds and 2 mammals (highlighted in grey in Table 5-2).

Table 5-2 Significant vertebrate fauna identified in the desktop review

Species	Status	Proximity to study area	Habitat
Reptiles (2)			
Ctenotus angusticeps Airlie Island Ctenotus	P3 (DBCA list)	2.7 km NNE	Associated with samphire shrublands and saltmarshes (Maryan *et al.* 2013). Has been reported using crab holes for avoiding humans and for shelter at night.
Liasis olivaceus subsp. *barroni* Pilbara Olive Python	VU (EPBC & BC Acts)	26.4 km SSE	Commonly found in rocky areas in association with watercourses and pools and often associated with areas of permanent pooling water near rocky habitats, such as gullies, gorges and rocky ranges or boulder sites. It has also been recorded in riparian vegetation along major rivers (Barker & Barker 1994; Pearson 2003).
Non-migratory birds (5)			
Falco hypoleucos Grey Falcon	VU (BC Act)	6.7 km SSW	The Grey Falcon is a widespread but rare species inhabiting much of the hot, semi-arid and arid interior of Australia. Occurs in a wide variety of arid habitats including open woodlands and open *Acacia* shrubland, hummock and tussock grasslands and low shrublands, particularly where crossed by tree-lined water courses (Schoenjahn *et al.* 2019; Threatened Species Scientific Committee 2020).
Falco peregrinus Peregrine Falcon	OS (BC Act)	1.4 km SW	Preferred habitat includes cliffs and wooded watercourses. Nesting occurs mainly on cliff ledges, granite outcrops, quarries and in trees with old raven or Wedge-tailed Eagle nests (Johnstone & Storr 1998).
Pezoporus occidentalis Night Parrot	EN/CR (EPBC Act; BC Act)	*	Rare and cryptic species appearing to favour areas of dense vegetation comprising old-growth (often > 50 years unburnt) spinifex (*Triodia* spp.) especially hummocks that are ring-forming for roosting and nesting. Such areas may also be associated with dense chenopod shrubs. It is thought that spinifex hummocks that are <40-50 cm in height are not likely to provide adequate shelter for roosting and nesting (DPaW 2017).
Rostratula australis Australian Painted Snipe	EN (EPBC & BC Acts)	*	Generally, inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (DCCEEW 2023b).
Sterna nereis subsp. *nereis* Fairy Tern	VU (EPBC & BC Acts)	6.7 km NNE	In WA, the species is present along the entire coastline, with rare records from the far north (Kimberley) and off the Nullarbor Plain. It nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation (DCCEEW 2023b).
Migratory birds (51)			
Actitis hypoleucos Common Sandpiper	Mig. (EPBC & BC Acts)	2.2 km E	Found across a wide range of wetlands: small ponds, large inlets and mudflats where they forage on the shore usually close to the vegetation (DCCEEW 2023b). Prefers rocky creeks, channels, dams, and mangrove-lined inlets (Geering *et al.* 2007).
Anous stolidus Common Noddy	Mig. (EPBC & BC Acts)	*	In Australia the species, occurs mainly in ocean off the Queensland coast, but the species also occurs off the north-west and central WA coast. During the breeding season, the Common Noddy usually occurs on or near islands, on rocky islets and stacks with precipitous cliffs, or on shoals or cays of coral or sand (DCCEEW 2023b).

Species	Status	Proximity to study area	Habitat
Apus pacificus Fork-tailed Swift	Mig. (EPBC & BC Acts)	9.1 km NE	Widespread Migratory species that does not breed in Australia, typically present from October to April. It occurs in a wide range of dry or open habitats across most of WA and is uncommon to moderately common in the north-west (DCCEEW 2023b). Forages and roosts in flight so not limited by terrestrial habitat; flocks most often seen ahead of cyclones or during thunderstorms (Johnstone *et al.* 2013).
Arenaria interpres Ruddy Turnstone	Mig. (EPBC & BC Acts)	2.3 km E	Non-breeding migrant, common on Pilbara coast mainly from late August – April, but may be present year-round as juvenile birds overwinter here (Johnstone *et al.* 2013). Usually found on ocean coasts with exposed rock, stones, or shell beaches (Morcombe 2004).
Calidris acuminata Sharp-tailed Sandpiper	Mig. (EPBC & BC Acts)	2.2 km E	The Sharp-tailed Sandpiper is one of the most common Australian shorebirds. It occurs on saline wetlands such as coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands (DCCEEW 2023b).
Calidris alba Sanderling	Mig. (EPBC & BC Acts)	3.4 km SSW	Found mostly on open sandy beaches exposed to open sea-swell, and also on exposed sandbars and spits, shingle banks and beaches that may contain wave-washed rocky outcrops (DCCEEW 2023b).
Calidris canutus Red Knot	EN/Mig./EN (EPBC Act; BC Act)	3.4 km SSW	Widespread across coastal Australia often found in intertidal mudflats, sandbars, estuaries, harbours, lagoons, beaches, and reefs (IUCN 2019).
Calidris ferruginea Curlew Sandpiper	CR/Mig./CR (EPBC Act; BC Act)	2.3 km E	In Australia the species is strictly migratory and occurs in large numbers. Mainly occur on intertidal mudflats in sheltered coastal areas, also around non-tidal swamps, lakes, and lagoons near the coast. Less often inland around ephemeral and permanent lakes and waterholes, usually with bare edges of mud or sand (DCCEEW 2023b).
Calidris melanotos Pectoral Sandpiper	Mig. (EPBC & BC Acts)	8.9 km ENE	The Pectoral Sandpiper is an uncommon solitary shorebird found in wetlands, inland as well as on the coast. Occurs on shallow fresh to saline wetlands, usually coastal or near-coastal but occasionally further inland. Prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation (DCCEEW 2023b).
Calidris ruficollis Red-necked Stint	Mig. (EPBC & BC Acts)	2.1 km NNW	Mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores (DCCEEW 2023b).
Calidris subminuta Long-toed Stint	Mig. (EPBC & BC Acts)	2.3 km E	Occurs in a variety of terrestrial wetlands, preferring shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds (DCCEEW 2023b).
Calidris tenuirostris Great Knot	CR/Mig./CR (EPBC Act; BC Act)	3.4 km SSW	Rarely found inland and are mainly found in coastal areas, intertidal mudflats, estuaries, inlets, harbours, lagoons, saltworks and mangrove swamps (DCCEEW 2023b).
Calonectris leucomelas Streaked Shearwater	Mig. (EPBC & BC Acts)	*	A marine species, occurs frequently in northern Australia, with records from central WA, around the north coast, and south to central New South Wales (Marchant & Higgins 1990).

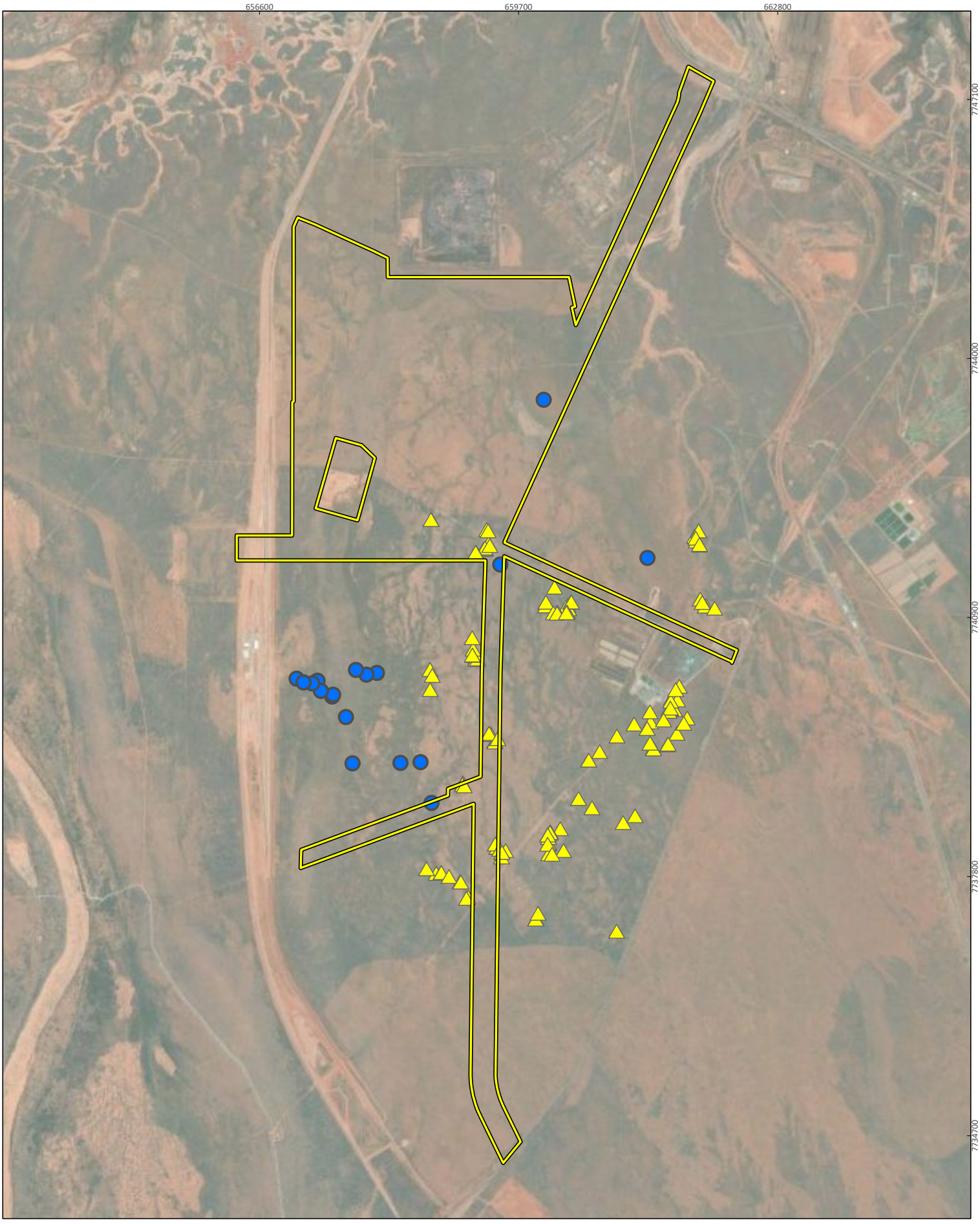
Species	Status	Proximity to study area	Habitat
Charadrius leschenaultii Greater Sand Plover	VU/Mig./VU (EPBC Act; BC Act)	3.4 km SSW	Almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly, or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons, inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs (DCCEEW 2023b).
Charadrius mongolus Lesser Sand Plover	EN/Mig. (EPBC & BC Acts)	3.4 km SSW	Found in coastal littoral and estuarine environments, it inhabits intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops (DCCEEW 2023b).
Charadrius veredus Oriental Plover	Mig. (EPBC & BC Acts)	6.7 km NNE	Inhabits coastal habitats such as estuarine mudflats and sandbanks, sandy or rocky ocean beaches or nearby reefs, or in near-coastal grasslands, before dispersing further inland where they inhabit flat, open, semi-arid or arid grasslands (DCCEEW 2023b).
Chlidonias leucopterus White-winged Black Tern	Mig. (EPBC & BC Acts)	2.2 km E	In Australia, the species mostly inhabits fresh, brackish or saline, and coastal or subcoastal wetlands. They also inhabit tidal wetlands, such as harbours, bays, estuaries and lagoons, and their associated tidal sandflats and mudflats (DCCEEW 2023b).
Fregata ariel Lesser Frigatebird	Mig. (EPBC & BC Acts)	6.4 km NNE	A pelagic bird, this species is usually found far from land over water (Marchant & Higgins 1990).
Fregata minor Great Frigatebird	Mig. (EPBC & BC Acts)	*	Occurs in tropical and subtropical seas, coasts and islands, and is a regular visitor to the west Australian coast (Pizzey & Knight 2012).
Gallinago stenura Pin-tailed Snipe	Mig. (EPBC & BC Acts)	4.7 km ENE	Occurs at edges of freshwaters swamp and ponds, and is also found on more open wetlands such as claypans (DCCEEW 2023b).
Gelochelidon nilotica Gull-billed Tern	Mig. (BC Act)	1.1 km SSE	Occur in freshwater swamps, salt lakes, beaches, mudflats and sewage farms, and are rarely found over the ocean (DCCEEW 2023b).
Glareola maldivarum Oriental Pratincole	Mig. (EPBC & BC Acts)	19 m ESE	In Australia, it inhabits open plains, floodplains and grasslands, often with extensive bare areas (DCCEEW 2023b).
Hirundo rustica Barn Swallow	Mig. (EPBC & BC Acts)	2.2 km E	Occurs in open country in coastal lowlands, an uncommon visitor to Australia (DCCEEW 2023b).
Hydroprogne caspia Caspian Tern	Mig. (EPBC & BC Acts)	2.3 km E	Found in sheltered coastal habitats and near-coastal terrestrial wetlands (DCCEEW 2023b).
Limicola falcinellus Broad-billed Sandpiper	Mig. (BC Act)	9.8 km NE	Occurs in sheltered coastal habitats such as saltmarshes, lagoons, sewage farms and mudflats (DCCEEW 2023b).

Species	Status	Proximity to study area	Habitat
Limnodromus semipalmatus Asian Dowitcher	Mig. (EPBC & BC Acts)	7.5 km NE	Occurs in sheltered coastal environments, such as lagoons and estuaries, and exposed mudflats. The Port Hedland Saltworks IBA provides crucial habitat for this species (DCCEEW 2023b).
Limosa lapponica Bar-tailed Godwit	Mig. (EPBC & BC Acts)	3.3 km E	Found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays (DCCEEW 2023b).
Limosa limosa Black-tailed Godwit	Mig. (BC Act)	12.8 km ENE	Occurs in coastal habitats, such as sheltered bays, estuaries, lagoons, mudflats and sandflats, and is also found in near-coastal wetlands (DCCEEW 2023b).
Macronectes giganteus Southern Giant Petrel	EN/Mig./Mig. (EPBC Act; BC Act)	*	The Southern Giant Petrel occurs in Antarctic to subtropical waters and breeds on 6 subantarctic and Antarctic islands in Australian territory; Macquarie Island, Heard Island and McDonald Island in the Southern Ocean, and Giganteus Island, Hawker Island, and Frazier Island in the Australian Antarctic Territories (DCCEEW 2023b).
Motacilla cinerea Grey Wagtail	Mig. (EPBC & BC Acts)	*	Vagrant visitor to Australia that inhabits fast flowing streams and rivers (IUCN 2019).
Motacilla flava Yellow Wagtail	Mig. (EPBC & BC Acts)	7.9 km NNE	Uncommon but regular visitor to Pilbara; primarily inhabits a range of damp or wet habitats with low vegetation including damp meadows, marshes, waterside pastures, and sewage farms (IUCN 2019; Johnstone *et al.* 2013).
Numenius madagascariensis Eastern Curlew	CR/Mig./CR (EPBC Act; BC Act)	3.3 km E	Occurs mainly on intertidal mudflats, on exposed seagrass beds or mudflats (Geering *et al.* 2007). Also utilises sand spits of estuaries, mangroves, lake shores and ocean beaches.
Numenius minutus Little Curlew	Mig. (EPBC & BC Acts)	2.3 km E	Found on short, dry grasslands and dry grass edges of freshwater inlands (Geering *et al.* 2007).
Numenius phaeopus Whimbrel	Mig. (EPBC & BC Acts)	3.3 km E	Forages on intertidal mudflats, estuaries and lagoons, occasionally foraging on beaches and on rock platforms (DCCEEW 2023b).
Oceanites oceanicus Wilson's Storm Petrel	Mig. (EPBC & BC Acts)	7.9 km NNE	Only occurs at sea, mainly found in tropical and subtropical waters (DCCEEW 2023b).
Onychoprion anaethetus Bridled Tern	Mig. (EPBC & BC Acts)	6.8 km N	Occurs in tropical and subtropical seas, rarely found in inshore continental waters (DCCEEW 2023b).
Pandion cristatus Osprey	Mig. (EPBC & BC Acts)	1.0 km NNE	Occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. Occur in a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes (DCCEEW 2023b).
Phalaropus lobatus Red-necked Phalarope	Mar/Mig. (EPBC Act; BC Act)	34.2 km E	In Australia, this species occurs at lakes and swamps, both inland and coastal (DCCEEW 2023b).

Species	Status	Proximity to study area	Habitat
Philomachus pugnax Ruff	Mig. (EPBC & BC Acts)	3.4 km SSW	In Australia the Ruff is found on generally fresh, brackish of saline wetlands with exposed mudflats at the edges (DCCEEW 2023b).
Plegadis falcinellus Glossy Ibis	Mig. (EPBC & BC Acts)	28.5 km NE	Predominantly inhabits terrestrial wetlands, foraging in shallow water over soft substrate or on grassy or muddy verges of wetlands providing a variety of water depths. Inland, freshwater wetlands are preferred, especially permanent or ephemeral waterbodies on floodplains and shallow swamps with abundant aquatic flora (Johnstone *et al.* 2013; Marchant & Higgins 1990).
Pluvialis fulva Pacific Golden Plover	Mig. (EPBC & BC Acts)	8.4 km W	In Australia this species usually inhabits coastal habitats, on beaches, mudflats and sandflats (DCCEEW 2023b).
Pluvialis squatarola Grey Plover	Mig. (EPBC & BC Acts)	3.3 km E	Occurs on intertidal mudflats, saltmarshes, sandflats and beaches of oceanic coastlines, bays and estuaries. During migration it may also be found inland on lakes, pools or grasslands (del Hoyo *et al.* 2014; IUCN 2019).
Sterna hirundo Common Tern	Mig. (EPBC & BC Acts)	6.4 km NNE	In Australia, they occur in near-coastal waters, both on ocean beaches, platforms and headlands and in sheltered waters, such as bays, harbours and estuaries with muddy, sandy or rocky shores (DCCEEW 2023b).
Sternula albifrons Little Tern	Mig. (EPBC & BC Acts)	6.4 km N	In Australia, they inhabit sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets (DCCEEW 2023b).
Sula leucogaster Brown Booby	Mig. (EPBC & BC Acts)	13.3 km NNE	Occurs in tropical waters, including coastal waters, harbour and estuaries, but is rarely seen flying over land (DCCEEW 2023b).
Thalasseus bergii Crested Tern	Mig. (BC Act)	3.3 km E	Inhabits tropical and subtropical coastlines. Found along the entire Australian coast (IUCN 2019).
Tringa brevipes Grey-tailed Tattler	Mig. EPBC and BC Acts; P4 DBCA list	3.3 km E	Occurs on sheltered coasts with reefs and rock platforms or mudflats, and can also be found on reefs or platforms that are exposed at low tide (DCCEEW 2023b).
Tringa glareola Wood Sandpiper	Mig. (EPBC & BC Acts)	2.2 km E	Prefers the shallows of wooded lakes or swamps with trees. It also inhabits freshwater swamps, lakes, flooded pastures and occasionally, mangroves (Morcombe 2004).
Tringa nebularia Common Greenshank	Mig. (EPBC & BC Acts)	2.3 km E	Mostly on the coast but sometimes inland; uses permanent and ephemeral terrestrial wetlands, including rivers and creeks (DCCEEW 2023b).
Tringa stagnatilis Marsh Sandpiper	Mig. (EPBC & BC Acts)	6.4 km NNE	Inhabits coastal and inland wetlands, estuarine and mangrove mudflats, beaches, swamps, lakes and several other types of wetlands (Morcombe 2004).
Xenus cinereus Terek Sandpiper	Mig. (EPBC & BC Acts)	3.4 km SSW	Inhabits coastal mudflats, sheltered estuaries and lagoons. In Australia, it has a primarily coastal distribution, with occasional records inland (Morcombe 2004).

Species	Status	Proximity to study area	Habitat
Mammals (7)			
Dasycercus blythi Brush-tailed Mulgara	P4 (DBCA list)	Inside	Occurs in spinifex grasslands throughout much of the arid zone, digging their burrows in the flats between low sand dunes (Van Dyck & Strahan 2008).
Dasyurus hallucatus Northern Quoll	EN (EPBC & BC Acts)	4.0 km WNW	Most commonly found in rocky areas, with rugged rocky habitats such as gorges, gullies, escarpments, boulder fields and small caves critical for denning and shelter (DCCEEW 2023b).
Lagostrophus fasciatus fasciatus Banded Hare-wallaby (mainland)	P4 (DBCA list)	Inside	**Locally Extinct.**
Macroderma gigas Ghost Bat	VU (EPBC & BC Acts)	25.0 km SSE	Roost sites include caves, rock crevices and disused mine adits. Foraging habitat in areas surrounding roost sites, mostly woodlands and watercourses (Bullen 2021).
Macrotis lagotis Greater Bilby	VU (EPBC & BC Acts)	Inside	Bilby prefers hummock grassland in plains and alluvial areas, open tussock grassland on uplands and hills, mulga woodland/shrubland on ridges and rises (DCCEEW 2023b), loamy or sandy soils associated with palaeodrainage lines and perched drainage lines, dune fields and sandplains; recently burnt habitat (1-3 years) is used frequently (DBCA 2018).
Mormopterus cobourgianus North-western Free-tailed Bat	P1 (DBCA list)	3.1 km NNE	Occurs in mangrove habitats in WA, where they roost in tree hollows (Reardon 2014).
Pseudomys chapmani Western Pebble-mound Mouse	P4 (DBCA list)	27.7 km E	Restricted to non-coastal, central and eastern parts of the Pilbara where preferred habitat comprises gentle, sparsely vegetated slopes of rocky ranges (Morris & Burbidge 2008).
Rhinonicteris aurantia (Pilbara) Pilbara Leaf-nosed Bat	VU (EPBC & BC Acts)	27.4 km E	Normally restricted to caves and mine adits (horizontal shafts) with stable, warm and humid microclimates (Van Dyck & Strahan 2008), but temporary roosts such as crevices and tree hollows may be used in warm and humid conditions, allowing greater dispersal during the wet season.

* EPBC Protected Matters Search does not return species location and includes instances where suitable habitat may occur but the species has not necessarily been observed. Rows highlighted in grey represent significant vertebrate species recorded within 5 km of the study area.



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Project No	1557
Date	29/05/2023
Drawn by	FK
Map author	JA

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Kilometers

1:58,500 (at A4) GDA 1994 MGA Zone 50

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Study area

Species, Status

Bilby,VU (EPBC & BC Acts)

Brush-tailed Mulgara,P4 (DBCA list)

Figure 5-2

Conservation significant fauna previously recorded in the study area

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5.1.2 SRE invertebrate fauna

The desktop review identified records of 7 confirmed SRE taxa and 78 potential SRE taxa from within the SRE desktop search area (Table 5-3; Figure 5-2; Appendix 3). A further 50 taxa of uncertain SRE status and 70 non-SRE (i.e., widespread) taxa from SRE groups were identified. The desktop records indicate one SRE species of uncertain status (Rhagada 'sp. indet', one record) has been recorded within the study area (Figure 5-2). A further 23 taxa have been recorded within 5 km of the study area, comprising 5 mygalomorph spiders (family Anamidae), 5 pseudoscorpion (Chthoniidae, Olpiidae), 5 scorpions (Buthidae, Urodacidae), 2 isopods (Armadillidae) and 6 land snails (Pupillidae), of which 13 are widespread, 7 are uncertain and 3 are potential SRE taxa.

Scorpions were the most commonly recorded SRE group within the 100 km buffered desktop search area (20.5% of the total number of taxa), followed by land snails (19.5%) and pseudoscorpions (19.0%). Centipedes and harvestmen spiders were poorly represented with only 4 and 2 taxa identified respectively, none of which were confirmed or potential SREs.

Of the 85 taxa confirmed or potential SRE taxa, 13 are named species. These comprise of 5 millipedes, 3 land snails, 2 mygalomorph spiders, 1 isopod, 1 pseudoscorpion and 1 selenopid spider. The remaining 72 comprise taxa named only to morphospecies codes as applied by the WA Museum or are not identified to confirmed species level (i.e. "sp." or "cf."). The majority of taxa records of uncertain SRE status are unidentifiable ("sp. indet.", i.e. female or juvenile specimens) or could not be identified to species or morphospecies and may represent new species or other species listed in the same genus where records exist (Table 5-3).

Table 5-3 Summary of SRE taxa identified in the desktop review

Group	SRE Status				Total
	Confirmed	Potential	Uncertain	Not SRE	
Centipedes	0	0	3	1	4
Harvestmen spiders	0	0	2	0	2
Isopods	0	7	5	6	18
Land snails	0	11	5	24	40
Millipedes	3	7	5	3	18
Mygalomorph spiders	2	18	10	8	38
Pseudoscorpions	1	16	16	6	39
Scorpions	0	18	3	21	42
Selenopid spiders	1	1	1	1	4
Total	**7**	**78**	**50**	**70**	**205**

5.2 FIELD SURVEY

5.2.1.1 Vertebrate fauna

5.2.1.1.1 Habitats

Three broad fauna habitat types were identified in the study area during the survey. These comprise (in order of extent): sandplains, open woodlands and drainage lines (Table 5-4; Figure 5-3). The study area also contains areas that are mapped as cleared/disturbed; these areas are largely devoid of native vegetation and predominantly comprise of roads and unsealed access tracks).

Sandplains cover a most of the study area (1,514 ha; 95.6%) and are characterised by red-orange sandy soils on a gently undulating plain. The dominant vegetation complexes comprise of spinifex hummock grasslands and low *Acacia stellaticeps* shrublands. At the low points of the undulating plain, there are shallower sandy soils small isolated clay pans (<10 m^2) occur that support shallow temporary water pools, immediately after rain. The surrounding vegetation surring the low points are typically dominated by small (stunted) spinifex hummock grasslands, often without a supporting shrub layer. In contrast to this, at local high points of the undulating plain, sandy soils are deeper and support taller shrublands usually dominated by *Acacia tumida pilbarensis* over dense-low *Acacia stellaticeps*, isolated to scattered *Acacia inequalateria* and *Grevillia wickamii* over spinifex hummock grass.

Open woodlands comprise only 15.4 ha (0.9%) of the study area, occurring at 2 discrete locations within the study area. The majority of open woodlands habitat (14.5 ha) is situated in the east, intersecting the eastern boundary of the study area (approximately 500 m south of the old Whim Creek Road; Figure 5-3. The remaining 0.9 ha of open woodlands is situated near the western boundary, approximately 250 m north of the old Whim Creek Road (Figure 5-3). Open woodlands are characterized by the presence of low to moderately dense, evenly distributed *Eucalyptus leucaphloia* trees. These are set over a sparse to scattered layer of stage 2 and 3 spinifex hummocks, native tussock, and invasive buffel grasses. The soil is a red-orange sandy-clay, featuring an almost flat surface layer of shallow clay, indicative of seasonal or sporadic inundation. At the eastern extent of the study area the open woodland habitat continues eastward, beyond the study area boundary, narrowing into diffuse drainages heading east and northeast.

The linear infrastructure corridor in the north-east intersects a small section of drainage line (8.9 ha; 0.6%) habitat. This area comprises of open to scattered low *Acacia stellaticeps* shrubland over small stage 3 and 4 spinifex hummock grasses. The small area comprising drainage line habitat within the study area is a Heritage protected area due to the presence of shell middens. As a result of its existing Heritage status and small extent, no fauna sampling was conducted in this area and it is only considered in brief.

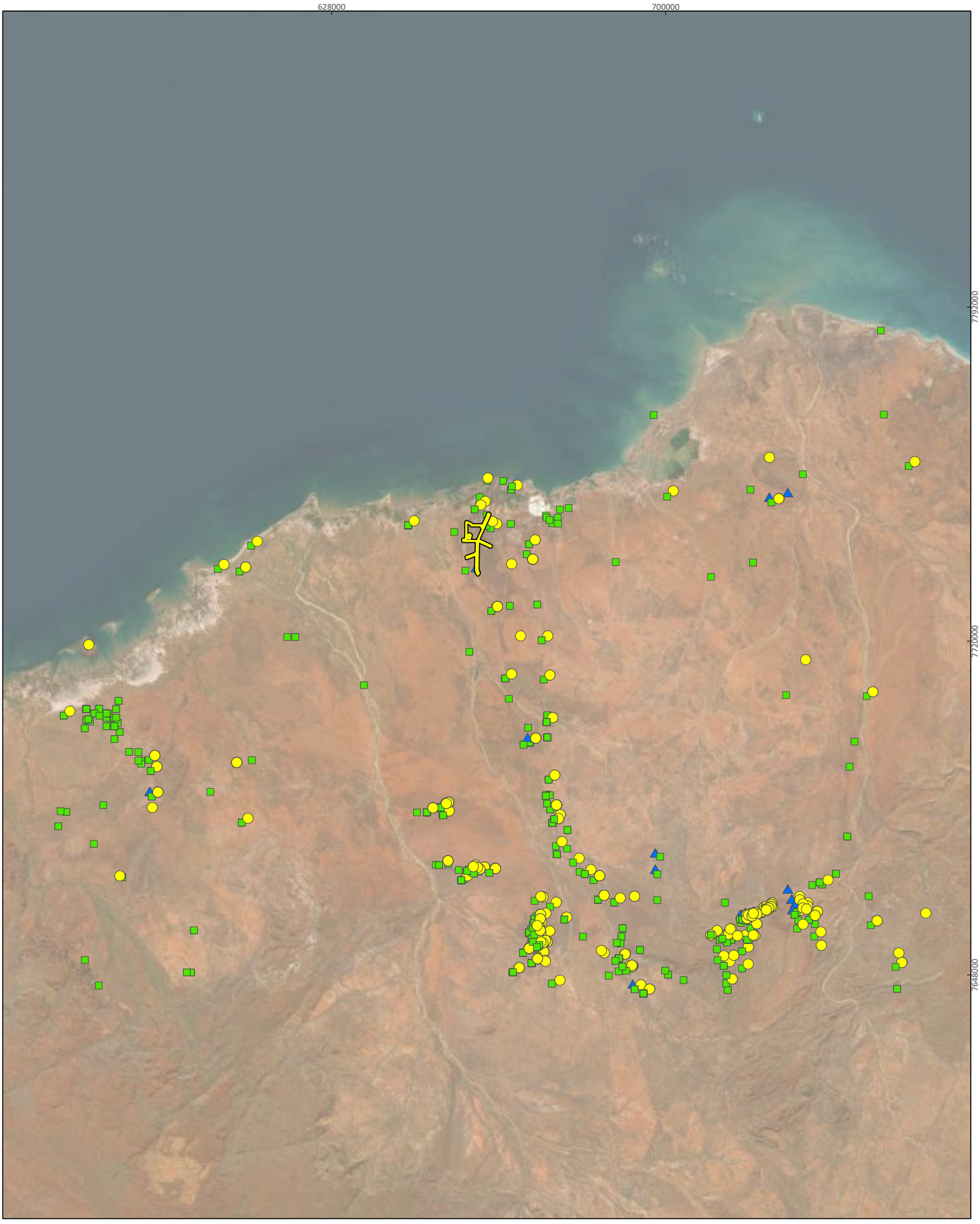
A total of 45.1 ha (2.9%) of the study area has been cleared/disturbed and is largely devoid of native vegetation.

Table 5-4 Extent and description of each fauna habitat in the study area

Habitat type	Site/s	Description	Extent in and % of study area	Representative photos
Sandplains	BP025, BT004, BT006, BP021, BP023, BP024, BP022, BT007, BIE001, BIE003, BIE004, Opp013, BIE002, Opp001, Opp008, Opp002, BT003, Opp005, BP004, BIE007, Opp014, Opp006, BP005, Opp003, Opp010, Opp009, BP006, BP003, BIE010, BIE009, BT002, BP002, BP001, BP015, Opp004, Opp007, BP016, Opp015, BT001, Opp016, BP018, BP007, BP008, BP009, BP011, BP013, BP020	Mosaic of spinifex hummock grasslands and low *Acacia stellaticeps* shrublands on an undulating plain. Isolated Pundle trees over mixed *Acacia stellaticeps* dominant shrublands (A. *tumida* and A. *inequalatera* scattered to widely scattered) over stage 2 to 5 spinifex hummock grasslands on red-orange sandy soils.	1,514.0 ha (95.6)	

Habitat type	Site/s	Description	Extent in and % of study area	Representative photos
Open woodlands	BIE006, BIE005, BIE008, BP017, BP019, BP014	Shallow flat depression relative to surrounding sandplain. Open low to mid *Eucalyptus* woodland over evenly scattered, open tussock grasses (native and buffel) with spinifex hummocks variably present. Predominantly sandy soil with a shallow sandy-clay crust. Surrounded by low sandy rise with dense mature spinifex hummocks and mixed *Acacia* dominant shrubs including *A. stellaticeps, A. tumida pilbarensis* and isolated *A. inequalatera.* Higher percentage cover of leaf litter than the surrounding areas, forming transported clumps.	15.4 ha (0.9)	

Habitat type	Site/s	Description	Extent in and % of study area	Representative photos
Drainage line	BIE011	Small section of the Foreshore flats with intertidal water flow, predominantly dry. Heritage protected area due to incidence of shell middens. Low *Acacia stellaticeps* shrubland with widely scatted *Acacia tumida pilbaraenses* over stage 3 and 4 spinifex hummock grasses on red-orange to orange sandplain.	8.9 ha (0.6)	
Cleared/disturbed	Opp011	Cleared areas with infrastructure and roads.	45.1 ha (2.9)	



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Project No	1557
Date	29/05/2023
Drawn by	FK
Map author	JA

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Kilometers

1:1,054,000 (at A4) GDA 1994 MGA Zone 50

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Study area

SRE status

- Potential
- Confirmed
- Uncertain

Figure 5-3

Desktop records of SRE invertebrates

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5.2.1.1.2 Assemblage

A total of 103 terrestrial vertebrate species representing 44 families and 79 genera were recorded in the study area during the field surveys (Appendix 5). The assemblage included 101 native species and 2 introduced species.

The recorded assemblage represents 27.9% of the species identified in the desktop review (Table 5-5).

Table 5-5 Number of vertebrate species recorded in survey in comparison to desktop results, by group

Group	No. species identified in desktop review	No. species recorded in survey	Recorded assemblage (%)
Amphibians	12	2	16.7 (1.9)
Reptiles	94 (inc. 2 introduced)	38	40.4 (36.9)
Birds	218 (including 2 naturalised)	48	46.6 (22.0)
Mammals	45 (inc. 11 introduced)	15 (inc. 2 introduced)	14.6 (33.3)
Total	**369**	**103**	**27.9**

Values in parentheses indicate the overall percentage of records per class recorded during the survey

The 2 amphibians recorded during the field survey included one tree frog (family Pelodryadidae) and one burrowing frog (Limnodynastidae). The 38 reptiles recorded include 5 snakes (Elapidae, Typhlopidae), 4 legless lizards (Pygopodidae), 6 geckoes (Diplodactylidae, Gekkonidae), 16 skinks (Scincidae), 4 goannas (Varanidae) and 3 dragons (Agamidae). The 13 native mammal taxa recorded included 3 carnivorous marsupials (Dasyuridae), one macropod (Macropodidae), one omnivorous marsupial (Thylacomyidae), 5 microchiropteran bats (Molossidae, Vespertilionidae), 2 rodents (Muridae) and one monotreme (Tachyglossidae). Birds from 12 non-passerine families (25 species) and 16 passerine families (23 species) were recorded; Raptors (Accipitridae, Falconidae) represented the highest level of diversity with 10 species recorded. A total of 2 introduced mammals (Canidae, Felidae) were recorded.

This assemblage included one species not identified in the desktop review; Black Falcon (*Falco subniger*), which also is a locally significant record (Figure 5-3)**.** In WA, Black Falcon is not listed as significant under the EPBC and/or BC Act. The species is state-listed in other parts of its range: in New South Wales it is listed as VU under the BC Act (April 2023 list), in South Australia as Rare under the National Parks and Wildlife Act 1972 (January 2020 list), and in Victoria as CR under the Flora and Fauna Guarantee Act 1988 (June 2023 list) (DCCEEW 2023b).

Figure 5-4 plots the species accumulation of systematic data captured during the survey. The 4 indices (Sobs, Chao2, Jacknife2 and Bootstrap) all indicate that the systematic survey effort was adequate for the study area, in that few additional species were recorded towards the end of the sample period and it is expected that few remain undetected. This is considered consistent with the low broad habitat diversity within the study area.

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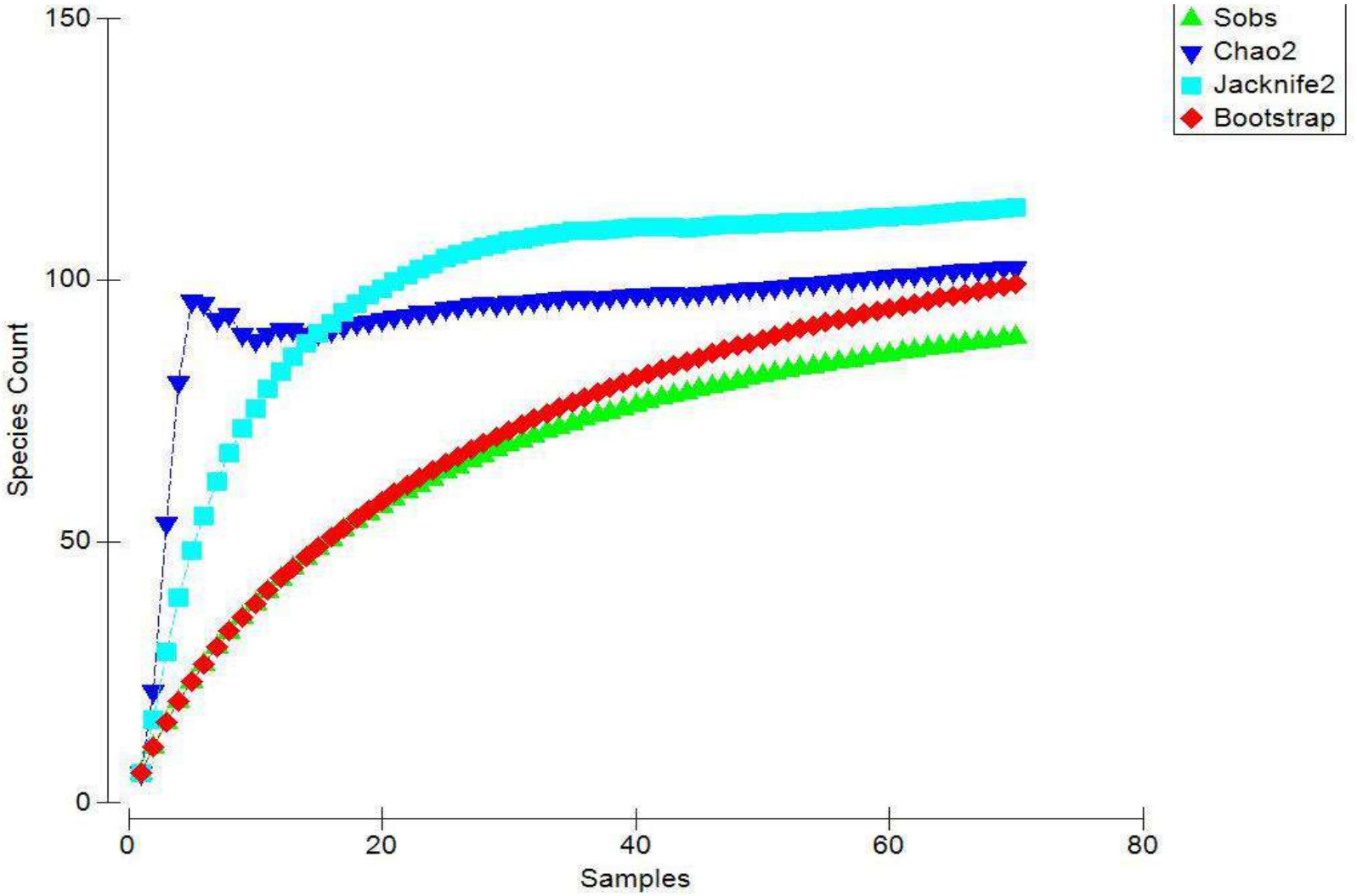


Figure 5-4 Species accumulation curve for vertebrate fauna

5.2.1.1.3 Significant vertebrate fauna

Two Threatened, one Priority and 2 Migratory listed species were recorded in the survey, including: Greater Bilby (*Macrotis lagotis*, VU), Grey Falcon (*Falco hypoleucos*, VU), Brush-tailed Mulgara (*Dasycercus blythi*, P4), Fork-tailed Swift (*Apus pacificus*, Mig.) and Osprey (*Pandion cristatus*, Mig.) (

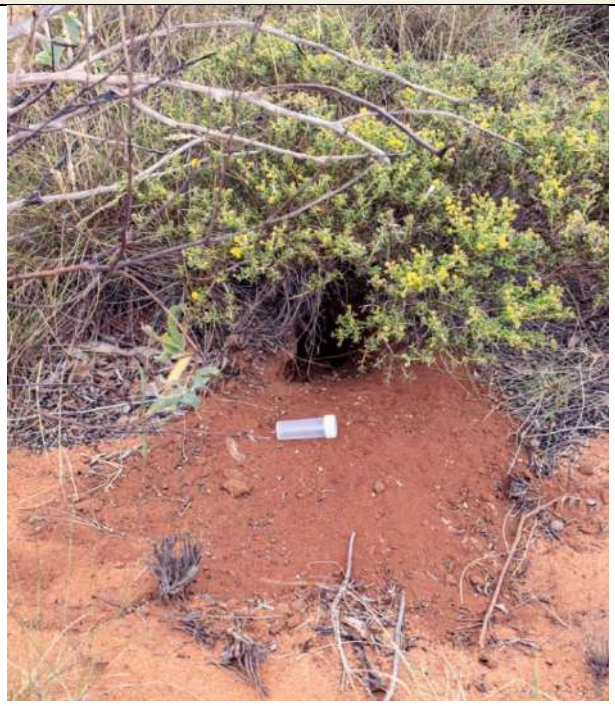
Table 5-6; Figure 5-3).

No other significant fauna were identified in the survey in accordance with EPA (2020) (see section 2.2.3)

Threatened and Priority fauna records were reported to DBCA via the licencing return system.

Table 5-6 Details of significant vertebrate fauna recorded during the field survey

Species	Status	Survey records	Representative photograph
Macrotis lagotis Greater Bilby	VU (EPBC & BC Acts)	128 records (112 in study area): 32 old diggings (top photo) 53 old scats in study area, 16 nearby (bottom right photo); 12 records of recent diggings (middle photo) and 15 records of recent scats (bottom left photo).	   

Species	Status	Survey records	Representative photograph
Dasycercus blythi Brush-tailed Mulgara	P4 (DBCA list)	2 records of active or recently active burrows (BIE010, BIE009)	
Apus pacificus Fork-tailed Swift	Mig. (EPBC & BC Acts)	1 record, directly sighted (BIE04)	No photo.
Pandion cristatus Osprey	Mig. (EPBC & BC Acts)	One record, directly sighted (Opp11)	
Falco hypoleucos Grey Falcon	VU (BC Act)	2 records (one pair and fledged juv.), directly sighted (BIE001, Opp15)	

The likelihood of occurrence assessment (section 4.2.2.12) for the remaining significant species identified in the desktop review (Table 5-2) determined none were likely to occur in the study area, 3 may possibly occur and 58 are unlikely to occur (Table 5-7).

Table 5-7 Likelihood of occurrence of relevant significant vertebrate fauna identified in the desktop survey and recorded in the field survey categorised as Recorded (5), likely (0), possible (3) and unlikely (58)

Species	Status	Proximity to Study Area	Habitat Preferences	Likelihood	Comment
Reptiles (2)					
Ctenotus angusticeps Airlie Island Ctenotus	P3 (DBCA list)	2.7 km NNW	The Airlie Island Ctenotus is known from approximately 12 locations in northwest WA {Department of the Environment and Energy, 2018 #18966}. On the mainland it generally inhabits the landward fringe of salt marsh communities in samphire shrubland or marine couch grassland {Maryan, 2013, #19073} in the intertidal zone along mangrove (Grey Mangrove (*Avicennia marina*) with occasional Red Mangrove (*Rhizophora stylosa*)) margins, however, subtle differences in vegetation/topography exist among sites where the species has been recorded {Biologic, 2012, #19074}	Unlikely	The project is unlikely to significantly impact populations nearby and this species may only be detected in low abundance (if detected at all)
Liasis olivaceus barroni Pilbara Olive Python	VU (EPBC & BC Acts)	26.4 km SSE	It is commonly found in rocky areas in association with watercourses and pools and often associated with areas of permanent pooling water near rocky habitats, such as gullies, gorges and rocky ranges or boulder sites	Unlikely	Given the lack of recent records and the wide available habitats outside the study area, it is unlikely that the study area supports a significant number of this species or provides important resources for significant life history stages
Non-migratory Birds (5)					
Falco hypoleucos Grey Falcon	VU (BC Act)	463 m SSW	It uses a large variety of habitats such as timbered plains, creeklines, shrublands and open grasslands.	**Recorded**	
Falco peregrinus Peregrine Falcon	OS (BC Act)	238 m NNW	The Peregrine Falcon's preferred habitat includes cliffs and wooded watercourses. Nesting occurs mainly on cliff ledges, granite outcrops, quarries and in trees with old raven or Wedge-tailed Eagle nests.	Unlikely	Given this species' potentially wide dispersal ability, it is possible to utilise the available habitat within the study area. While they can disperse, they often return to their initial home range once mature to breed. This species is not considered common in any part of Australia therefore the potential to detect them within the study area is possible but may not occur
Pezoporus occidentalis Night Parrot	EN/CR (EPBC Act; BC Act)	Projected distribution	appears to favour areas of dense vegetation comprising old-growth (often > 50 years unburnt) Spinifex (*Triodia* spp.) especially hummocks that are ring-forming for roosting and nesting. Such	Unlikely	While suitable habitat exists within the study area, the lack of records reduces the probability of occupying the study area. Considering the

			areas may also be associated with dense chenopod shrubs. It is thought that Spinifex hummocks that are		threats to dispersal for Night Parrot, it is likely the study area occurs outside their typical range and would not support this species.
Rostratula australis Australian Painted Snipe	EN (EPBC & BC Acts)	Projected distribution	Inhabits shallow terrestrial fresh-brackish wetlands, including temporary and permanent lakes, swamps and claypans, waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains.	Unlikely	Negligible suitable habitat is within the study area, it is unlikely to be the preferred habitat when other, better-quality habitat is available.
Sterna nereis nereis Fairy Tern	VU (BC Act)	N/A	Sheltered beaches, banks and spits above the tide and usually below vegetation. They have been found to utilise a variety of other habitats including estuaries, lake islands, wetlands and the mainland coastline {DCCEEW, 2023 #15064}	Unlikely	While possible for this species to occur, the lack of spatial data and limited available habitat means that it is unlikely for this species to occupy the available habitat in significant numbers or during important life history stages (e.g., courtship or breeding).
Migratory Birds (52)					
Apus pacificus Fork-tailed Swift	Mig. (EPBC & BC Acts)	8.8 km NE	Occurs in a wide range of dry or open habitats, including riparian woodlands, tea-tree swamps, low scrub, heathland, Saltmarsh, grassland and spinifex sandplains, open farmland and inland and coastal sand-dunes {DSEWPaC, 2011 #1749}.	**Recorded**	
Pandion cristatus Osprey	Mig. (EPBC & BC Acts)	975 m N	P. *cristatus* is present across most of coastal Australia but is absent from Tasmania and Victoria. In south coastal Western Australia, the species extends as far east as Esperance {Johnstone, 1998 #433; Poole, 2002 #13077}.	**Recorded**	
Actitis hypoleucos Common Sandpiper	Mig. (EPBC & BC Acts)	1.9 km ENE	Small ponds, large inlets, and mudflats where they forage on the shore usually close to the vegetation.	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Anous stolidus Common Noddy	Mig. (EPBC & BC Acts)	Projected distribution	Found primarily in coastal areas and inland wetlands of the Pilbara and Kimberley regions {DCCEEW, 2023 #15064}	Unlikely	Given the lack of recent records and the wide available habitats outside the study area, it is unlikely that the study area supports a significant number of this species or provides important resources for significant life history stages
Arenaria interpres Ruddy Turnstone	Mig. (EPBC & BC Acts)	2.3 km ENE	Typically found in the northern parts of Australia in aquatic environments {ALA, 2023 #15047}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely

Calidris acuminata Sharp-tailed Sandpiper	Mig. (EPBC & BC Acts)	1.9 km ENE	Usually found in coastal regions containing exposed rocks. They are also found in tidal pools and beaches. They are also known to be found on sandy beaches, clay ridges and occasionally in estuaries, harbours and lagoons. They have been recorded on sewage ponds and mudflats {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Calidris alba Sanderling	Mig. (EPBC & BC Acts)	3.4 km WSW	Found utilising coastal environments open to sea swell as well as sandbars and spits and shingle banks. They also occur on wave-washed rock outcrops. They are also less frequently found in estuaries and inlet harbours and near coastal inland wetlands {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Calidris canutus Red Knot	EN/Mig./EN (EPBC Act; BC Act)	1.9 km ENE	Muddy edges of shallow fresh or brackish vegetated wetlands, including lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes inland {Department of the Environment and Energy, 2018 #18966}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Calidris ferruginea Curlew Sandpiper	CR/Mig./CR (EPBC Act; BC Act)	2.3 km ENE	Typically occupying intertidal mudflats, sandflats and sheltered coasts. They are also known to occupy beaches, lagoons, harbours and sandy beaches. They have also been recorded occupying saline terrestrial wetlands and sewage ponds and are rarely found in freshwater swamps {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Calidris melanotos Pectoral Sandpiper	Mig. (EPBC & BC Acts)	8.9 km E	Occurs on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand.	Unlikely	Negligible suitable habitat is within the study area, it is unlikely to be the preferred habitat when other, better-quality habitat is available.
Calidris ruficollis Red-necked Stint	Mig. (EPBC & BC Acts)	1.9 km ENE	Shallow fresh to saline wetlands such as coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Calidris subminuta Long-toed Stint	Mig. (EPBC & BC Acts)	1.9 km ENE	They are found across a wide range of open mudflat-like habitats in salt as well as freshwater systems.	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.

Calidris tenuirostris Great Knot	CR/Mig./CR (EPBC Act; BC Act)	3.4 km WSW	They occupy a variety of wetlands. They appear to favour shallow, freshwater and brackish wetlands including river floodplains, sewage ponds, swamps and lagoons. They are also known to occupy muddy shorelines, weeds and sedges and occasionally stunted samphire. They are known to occupy permanent wetlands and artificial lakes {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Calonectris leucomelas Streaked Shearwater	Mig. (EPBC & BC Acts)	Projected distribution	They usually occupy sheltered coastal habitats as well as mudflats and sandflats such as inlets, bays, harbours, estuaries and lagoons. They have been known to occupy reefs and rock platforms as well as shorelines and mangroves. There are also records in swamps near the coast, salt lakes and non-tidal lagoons {DCCEEW, 2023 #15064}	Unlikely	Coastal environments are marginally available within the study area but prone to disturbance. While technically possible due to dispersal potential, habitat preferences and lack of evidence mean it is unlikely for this species to occupy the study area in significant numbers or for significant life history stages
Charadrius leschenaultii Greater Sand Plover	VU/Mig./VU (EPBC Act; BC Act)	3.4 km WSW	It occurs frequently in northern Australia, with records from central Western Australia, around the north coast, and south to central New South Wales {Marchant, 1990 #346}.	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Charadrius mongolus Lesser Sand Plover	EN/Mig. (EPBC & BC Acts)	3.4 km WSW	Utilises coastal and estuarine environments. They typically occupy sheltered sandy or muddy beaches as well as intertidal sandbanks and mudflats, reefs and rock platforms. They have occasional records occupying saltworks, salt lakes and marginal saltmarshes and brackish swamps {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Charadrius veredus Oriental Plover	Mig. (EPBC & BC Acts)	1.1 km E	Typically found in coastal and estuarine environments. They are known to utilise intertidal mudflats and sandflats, as well as sheltered harbours. They are known to occasionally occupy sandy beaches and rock platforms. There are records of this species utilising saltmarshes, mangrove saltworks, brackish swamps and silt islands {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Chlidonias leucopterus White-winged Black Tern	Mig. (EPBC & BC Acts)	2.2 km NE	Oriental Plovers spend a few weeks in coastal habitats such as estuarine mudflats and sandbanks, on sandy or rocky ocean beaches or nearby reefs, or in near-coastal grasslands, before dispersing further inland, where they are found in sparsely vegetated plains or recently burnt open areas.	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Fregata ariel Lesser Frigatebird	Mig. (EPBC & BC Acts)	6.4 km NNE	Typically occurs in wetland environments such as brackish, saline and coastal areas. They are also known to occupy sheltered areas such as estuaries. harbours and lagoons particularly those with sandflats and mudflats {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.

Fregata minor Greater Frigatebird	Mig. (EPBC & BC Acts)	Projected distribution	This species has a wide distribution, moving between countries along the equator during non-breeding season, including the northern parts of Australia {BirdLife International, 2023 #15547}	Unlikely	Coastal environments are marginally available within the study area but prone to disturbance. While technically possible due to dispersal potential, habitat preferences and lack of evidence mean it is unlikely for this species to occupy the study area in significant numbers or for significant life history stages
Gallinago stenura Pin-tailed Snipe	Mig. (EPBC & BC Acts)	4.7 km E	It is usually seen in tropical or warmer waters off northern Western Australia, Northern Territory, Queensland and northern New South Wales.	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Gelochelidon nilotica Gull-billed Tern	Mig. (BC Act)	1.1 km E	They occur in marine, coastal and pelagic environments and are usually observed in coastal waters in beaches, platforms and sheltered areas including harbours and estuaries {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely
Glareola maldivarum Oriental Pratincole	Mig. (EPBC & BC Acts)	1.1 km E	Gull-billed Terns are found in freshwater swamps, brackish and salt lakes, beaches and estuarine mudflats, floodwaters, sewage farms, irrigated croplands and grasslands. They are only rarely found over the ocean.	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Hirundo rustica Barn Swallow	Mig. (EPBC & BC Acts)	2.2 km ENE	Inhabits open plains, floodplains or short grassland, wetlands, saltworks and sewage farms. May also occur along the coast, inhabiting beaches, mudflats and islands, or around coastal lagoons.	Unlikely	Given the recent record, ability to disperse and abundance of habitat it is possible that this species may rely on resources within the study area and was not detected during the survey
Hydroprogne caspia Caspian Tern	Mig. (EPBC & BC Acts)	2.3 km ENE	Found in a variety of aquatic habitats including coastal areas, salt exploitation sites, wastewater treatment areas, cliffs and rocky islands, estuaries and intertidal areas with sand, rocks, mud or a combination of these substrates {BirdLife International, 2023 #15578}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Limicola falcinellus Broad-billed Sandpiper	Mig. (BC Act)	7.3 km NE	Found in sheltered coastal environments, mudflats and favours estuarine habitats. Occasionally they have been found occupying saltmarshes, freshwater lagoons, saltworks and sewage farms. They have also been known to occupy creeks, swamps and lakes near the coast, favouring those with mudflats and exposed sands with receding tides {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Limnodromus semipalmatus Asian Dowitcher	Mig. (EPBC & BC Acts)	2.3 km ENE of study area	Found in sheltered coastal habitats and near-coastal terrestrial wetlands {DAWE, 2022 #13929}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant

					number of individuals and therefore the outcome is unlikely.
Limosa lapponica Bar-tailed Godwit	Mig. (EPBC & BC Acts)	3.3 km ENE	Inhabits sheltered coastal habitats including tidal creeks, coastal lagoons and estuaries. There are many records utilising mudflats and sandflats. They are also known to occupy ponds, saltworks and sewage farms {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Limosa limosa Black-tailed Godwit	Mig. (BC Act)	3.3 km ENE	Occurs predominantly in coastal habitats including sandflats, banks, mudflats harbours, estuaries and lagoons and bays. There are some records of sightings in sewage farms, salt lakes and brackish wetlands near the coast, as well as sandy beaches and rock platforms {Department of the Environment, 2015 #11714}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Macronectes giganteus Southern Giant Petrel	EN/Mig./Mig. (EPBC Act; BC Act)	Projected distribution	Typically found in coastal environments with sheltered bays, estuaries and lagoons. Habitat use is dictated by the tides. They are also found in shallow and sparsely vegetated near-coastal wetlands {DCCEEW, 2023 #15064}	Unlikely	It is very unlikely this species will occupy the study area and if found inside or nearby, will likely be passing through and not reliant on the habitat available within the study area in significant proportions or during important life history stages
Motacilla cinerea Grey Wagtail	Mig. (EPBC & BC Acts)	Projected distribution	Pelagic. Breeds on six subantarctic and Antarctic islands in Australian territory {Department of the Environment and Energy, 2018 #18966}.	Unlikely	Given the lack of recent records and the wide available habitats outside the study area, it is unlikely that the study area supports a significant number of this species or provides important resources for significant life history stages
Motacilla flava Yellow Wagtail	Mig. (EPBC & BC Acts)	7.3 km NE	Uses a large array of habitats. A small wagtail that is a vagrant visitor to Australia that inhabits fast-flowing streams and rivers {IUCN, 2019 #13085}.	Unlikely	Given the lack of recent records and the wide available habitats outside the study area, it is unlikely that the study area supports a significant number of this species or provides important resources for significant life history stages
Numenius madagascariensis Eastern Curlew	CR/Mig./CR (EPBC Act; BC Act)	3.3 km ENE	Uses a large variety of habitats.	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Numenius minutus Little Curlew	Mig. (EPBC & BC Acts)	1.9 km ENE of study area	Australia's largest and elusive shorebird. Little information is available on this species given this species' shyness and records taking flight at the first sign of disturbance {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.

Numenius phaeopus Whimbrel	Mig. (EPBC & BC Acts)	606 m ESE	They spend the non-breeding season in northern Australia from Port Hedland to the Queensland coast {Department of the Environment and Energy, 2018 #18966}.	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Oceanites oceanicus Wilson's Storm Petrel	Mig. (EPBC & BC Acts)	606 m ESE	Usually found on intertidal mudflats and sheltered coastal areas. They have also been found in other waterbodies including harbours, lagoons, estuaries, rivers and mangroves. Occasionally they are found in sandy and rocky beaches or intertidal areas {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Onychoprion anaethetus Bridled Tern	Mig. (EPBC & BC Acts)	6.8 km NW	Usually found on intertidal mudflats and sheltered coastal areas. They have also been found in other waterbodies including harbours, lagoons, estuaries, rivers and mangroves. Occasionally they are found in sandy and rocky beaches or intertidal areas {DCCEEW, 2023 #15064}	Unlikely	Given the age of this record as well as the species' habitat preferences, it is unlikely that this species will be occupying habitats within the study area and even less likely to be found within the study area in significant abundance
Phalaropus lobatus Red-necked Phalarope	Mar/Mig. (EPBC Act; BC Act)	34.2 km E	Records indicate their preference for occurring at sea during non-breeding periods. They have been recorded in inland coastal areas, highly saline water bodies including lakes, swamps and wetlands in Australia {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Philomachus pugnax Ruff	Mig. (EPBC & BC Acts)	3.4 km WSW of study area	Typically occupies saline and brackish wetlands with mudflats. They have been found in a range of wetlands including lakes, swamps, tidal rivers, and flood lands. There are some records of them occupying sheltered coastal areas such as harbours and estuaries and wetlands surrounded by dense vegetation {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Plegadis falcinellus Glossy Ibis	Mig. (EPBC & BC Acts)	1.9 km ENE of study area	Marine habitats and tropical waters. They typically occur in Pisonia-coconut vegetation and on sandy substrates. Other habitat preferences are not well understood {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Pluvialis fulva Pacific Golden Plover	Mig. (EPBC & BC Acts)	7.3 km NE	Inland, freshwater wetlands are preferred, permanent or ephemeral waterbodies on floodplains and shallow swamps with abundant aquatic flora.	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Pluvialis squatarola Grey Plover	Mig. (EPBC & BC Acts)	3.3 km ENE	Typically inhabits coastal environments and occasionally can be found in wetlands, mudflats and sandflats in sheltered areas. They have been found on islands, sand and coral cays. They have been recorded in terrestrial environments, usually near waterbodies and paddocks areas {DCCEEW, 2023 #15064}	Unlikely	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.

Thalasseus bergii Crested Tern	Mig. (EPBC & BC Acts)	3.3 km ENE	Inhabit a variety of aquatic environments including estuaries, lagoons, sheltered coastal areas, lakes, bays and harbours. Particularly those with sand banks or splits and exposed ocean beaches. This species is widespread but not favouring offshore continental islands or coral cays {DCCEEW, 2023 #15064}	Unlikely	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Sterna hirundo Common Tern	Mig. (EPBC & BC Acts)	6.4 km NNE	Occupies mostly sheltered coastal areas such as harbours, lagoons, estuaries and river deltas, particularly those with margins of sand or mud. They have been recorded utilising inland wetlands of both fresh and saline conditions, including lakes, rivers, creeks and artificial wetlands (sewage pools and saltworks included) {DCCEEW, 2023 #15064}	Unlikely	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Sternula albifrons Little Tern	Mig. (EPBC & BC Acts)	6.4 km N	Occupies a range of natural and artificial aquatic environments including irrigation land, water storage areas, lagoons, estuaries, coastal dunes, freshwater lakes as well as seasonal and intermittent freshwater lakes {BirdLife International, 2023 #15579}	Unlikely	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Sula leucogaster Brown Booby	Mig. (EPBC & BC Acts)	13.3 km NNE	In Western Australia, the Brown Booby is found from Bedout Island and near Onslow, and north to Bunker Group of islands in Queensland Off north-west Western Australia, Brown Boobies are most abundant 18–36 km from land, but also occur inside and outside these limits {Department of the Environment and Energy, 2018 #18966}. It uses both marine and terrestrial habitats but tends to stay close to breeding sites, such as tropical islands, continental islands, sand cays and atolls for breeding. It is known to approach mainland coastlines more than other boobies and has been recorded in coastal waters, harbours and estuaries and near offshore islands but seldom flying over land {Department of the Environment and Energy, 2018 #18966}.	Unlikely	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Tringa brevipes Grey-tailed Tattler	Mig. (EPBC and BC Acts; P4 DBCA list)	606 m ESE	Inhabits coastal areas, typically those sheltered such as embayments and estuaries, although they are also known to occupy rocky coasts and platforms. Occasionally they are found in inland waterbodies {DCCEEW, 2023 #15064}	Unlikely	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Tringa glareola Wood Sandpiper	Mig. (EPBC & BC Acts)	1.9 km ENE	Habitat preferences vary with activities. Feeding habitat preferences include shallow water and intertidal areas on rocky substrates, coral rubble, mudflats, mangroves and potentially seagrass. Breeding habitat includes the branches of mangroves or shrubs and driftwood. Otherwise, they favour habitats in sheltered	Unlikely	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This

			coastal environments and mudflat aquatic areas {DCCEEW, 2023 #15064}		species is unlikely to occur in significant numbers or undertake important life history stages
Tringa nebularia Common Greenshank	Mig. (EPBC & BC Acts)	1.9 km ENE	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes {Department of the Environment and Energy, 2018 #18966}.	Unlikely	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Tringa stagnatilis Marsh Sandpiper	Mig. (EPBC & BC Acts)	6.4 km NNE	They prefer coastal open mudflats.	Unlikely	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Xenus cinereus Terek Sandpiper	Mig. (EPBC & BC Acts)	3.4 km WSW	The Marsh Sandpiper occurs along the Western Australian coast and throughout parts of eastern Australia. It inhabits coastal and inland wetlands, estuarine and mangrove mudflats, beaches, swamps, lakes and several other types of wetlands {Morcombe, 2004 #558}.	Unlikely	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Mammals (9)					
Dasycercus blythi Brush-tailed Mulgara	P4 (DBCA list)	Within study area	Occurs in spinifex grasslands throughout much of the arid zone, digging their burrows in the flats between low sand dunes.	**Recorded**	
Macrotis lagotis Greater Bilby	VU (EPBC & BC Acts)	Within study area	Prefers hummock grassland in plains and alluvial areas, open tussock grassland on uplands and hills, and mulga woodland/shrubland on ridges and rises.	**Recorded**	
Dasyurus hallucatus Northern Quoll	EN (EPBC & BC Acts)	4.0 km WNW	Found in a variety of habitats; however, rocky areas provide important denning habitat, while they forage in nearby grasslands and creeklines.	**Possible**	Recent records for this species are available, additionally, records are within the study area. Therefore, it is likely that the study area can support this species.
Pseudomys chapmani Western Pebble-mound Mouse	P4 (DBCA list)	27.7 km E	The mounds are located on the gentle slopes of rocky ranges covered in rocky mulch, hard spinifex and sparse trees and shrubs (*Eucalyptus*, *Senna*, *Acacia* and *Ptilotus*). They are also often found near Acacia-dominated drainage lines.	**Possible**	Given the potential suitable habitat, proximity and date of the record, the study area may support a proportion of this population.
Rhinonicteris aurantia (Pilbara) Pilbara Leaf-nosed Bat	VU (EPBC & BC Acts)	27.4 km E	Obligate cave roosting species, forage for insects almost exclusively over freestanding water. Disperses between roost and foraging habitat via humid gorges and gullies to avoid desiccation and shelter from predation.	**Possible**	Given the distance to travel and forage within the study area, it is unlikely that the study area provides significant resources to this species.

Macroderma gigas Ghost Bat	VU (EPBC & BC Acts)	25.0 km SSE	Prefers to roost in caves beneath bluffs of low, rounded hills composed of Marra Mamba geology, granite rock piles in the Pilbara and sandstone elsewhere, as well as addits (abandoned mines).	Unlikely	Unlikely for this species to occupy the study area for important life history stages. Possible for them to infrequently use the habitat for foraging, although abundant foraging habitat is available outside the study area. Therefore it is unlikely the study area supports this population significantly.
Lagostrophus fasciatus fasciatus Banded Hare-wallaby (mainland)	P4 (DBCA list)	Within study area	Once widespread in the distribution of the Spectacled Hare-wallaby has contracted northwards and is now found in northern Queensland, the Northern Territory and northern WA (Kimberley and a small section of the Pilbara) {Burbidge, 2004 #3920; Van Dyck, 2008 #297}. In WA, habitat is dominated by spinifex, where large hummocks are available.	Unlikely	Given the lack of recent records and the wide available habitats outside the study area, it is unlikely that the study area supports a significant number of this species or provides important resources for significant life history stages
Mormopterus cobourgianus North-western Free-tailed Bat	P1 (DBCA list)	3.1 km NNE	Restricted range appearing to favour mangroves and adjoining areas in small spouts, crevices and dead branches of mangroves. This species is relatively data deficient {Australian Museum, 2020 #15546}.	Unlikely	Unlikely for this species to occupy the study area for important life history stages. Possible for them to infrequently use the habitat for foraging, although abundant foraging habitat is available outside the study area. Therefore it is unlikely the study area supports this population significantly.

5.2.1.2 SRE invertebrate fauna

5.2.1.2.1 Habitats

Three habitats were identified within the study area that are suitable habitat for SRE invertebrates (Table 5-8; Figure 5-5). All SRE habitats represent low value SRE habitat. Whilst the open woodland habitat seems locally isolated, it extends eastward outside the study area and connects to larger open woodlands along drainage lines.

Table 5-8 Extent and description of each SRE habitat in the study area

Habitat type	Site/s	Description	SRE habitat rating	Extent in study area and % of study area
Open woodlands	BIE006, BIE005, BIE008, BP017, BP019, BP014	Shallow flat depression relative to surrounding sandplain. Open low to mid Eucalyptus woodland over evenly scattered, open tussock grasses (native and buffel) with isolated Spinifex hummocks also present. Substrate predominantly sandy with some clay. Hardened crust present. Surrounded by low sandy rise with dense mature Spinifex hummocks and mixed *Acacia* dominant shrubs including *A. stellaticeps, A. tumida pilbarensis* and isolated *A. inequalatera.* Higher percentage cover of leaf litter than the surrounding areas, forming transported clumps.	Low	15.41 ha (0.9)
Sandplains	BP025, BT004, BT006, BP021, BP023, BP024, BP022, BT007, BIE001, BIE003, BIE004, Opp013, BIE002, Opp001, Opp008, Opp002, BT003, Opp005, BP004, BIE007, Opp014, Opp006, BP005, Opp003, Opp010, Opp009, BP006, BP003, BIE010, BIE009, BT002, BP002, BP001, BP015, Opp004, Opp007, BP016, Opp015, BT001, Opp016, BP018, BP007, BP008, BP009, BP011, BP013, BP020	Isolated Pundle trees over mixed *Acacia* dominant shrubland (*stellaticeps*, *tumida* and *inequalatera*) over stage 4 and 5 spinifex hummock grasses on red-orange sand.	Low	1,514.0 ha (95.6)
Drainage lines	BT001	Small section of the Foreshore flats with intertidal water flow, predominantly dry. Heritage protected area due to incidence of shell middens. Low *Acacia stellaticeps* shrubland with widely scatted *Acacia tumida pilbarensis* over small stage 3 and 4 spinifex hummock grasses on red-orange to orange sandplain.	Low	8.9 ha (0.6)
Cleared/disturbed	Opp011	Cleared areas with infrastructure and roads.	Low	45.0.ha (2.9)

5.2.1.2.2 SRE records

A total of 14 specimens from SRE groups were collected within the study area (Figure 5-5; Table 5-9). The assemblage comprises of 5 Mygalomorph spiders (*Aname*), 5 Isopods (*Armadillidae*), and 4 Pseudoscorpions (*Chernetidae*). Of these, 4 specimens could not be identified to species or morphospecies code as applied from the WA Museum. The assemblage includes one taxa resolved to species and three taxa to morphospecies code. All species represent potential SRE's except for the mygalomorph spider, *Aname sinuate*, which is widespread. Specimens were collected from sandplains and open woodlands within the study area; both are considered low value SRE habitat.

Table 5-9 Specimens from SRE groups recorded in the field survey

Higher order/ Family	Taxa	Site/s	Spec. num.	Habitat	SRE status	Comments on status
Class Arachnida, order Araneae						
Anamidae	Aname 'Phoenix0068'	BIE003	1	Sandplain	Potential	Species only known to morphospecies code from the Port Hedland Solar Farm project. Specimens were collected in a widespread habitat type that is not restricted to the study area.
Anamidae	Aname sinuata	BIE005	2	Open Woodland	Widespread	Widespread species known across the Pilbara region.
Mygalomorphae	Mygalomorphae sp. indet.	BIE006	2	Open Woodland	Potential	Specimens sequencing failed so could not be identified properly. Specimens recorded in a widespread habitat type; however, it is not continuous in the local area. Specimens recorded in this habitat type alone are likely restricted to the study area.
Class Arachnida, order Pseudoscorpion						
Chernetidae	Chernetidae 'Phoenix0146'	BIE006	4	Open Woodland	Potential	Specimens recorded in a widespread habitat type; however, it is not continuous in the local area. Specimens recorded in this habitat type alone are likely restricted to the study area.

Higher order/ Family	Taxa	Site/s	Spec. num.	Habitat	SRE status	Comments on status
Class Malacostraca, order Isopoda						
Armadillidae	Buddelundia 'Phoenix0145'	BIE006	3	Open Woodland	Potential	Specimens recorded in a widespread habitat type; however, it is not continuous in the local area. Specimens recorded in this habitat type alone are likely restricted to the study area.
Armadillidae	Buddelundia sp. indet.	BIE005, BIE006	1	Open Woodland	Potential	Specimens sequencing failed so could not be identified properly. Specimens recorded in a widespread habitat type; however, it is not continuous in the local area. Specimens recorded in this habitat type alone are likely restricted to the study area.


Old digging
Old scat
Old digging
Old scat
Old scat
Old digging
Old digging
Old scat
Old scat
Old scat
Recent scat
Old scat
Recent scat
Old scat
Dasycercus blythi
Old digging
Old scat
Old scat
Old scat
Old scat
Apus pacificus
Old scat
Old scat
Dasycercus blythi
Old scat
Old scat
Old digging
Pandion cristatus
Old scat
Old digging
Old scat
Old scat
Old scat
Old scat
Old scat
Old digging
Old digging
Old digging
Old digging
Old scat
Old scat
Old scat
Old scat
Falco hypoleucos
Old digging
Old digging
Old digging
Old digging
Old digging
Old scat
Old scat

5.3 SURVEY LIMITATIONS

The limitations of the terrestrial fauna survey have been considered in accordance with EPA (2016b, d) (Table 5-10).

Table 5-10 Consideration of potential survey limitations

Limitations	Comments
Availability of contextual information at a regional and local scale	Database searches and previous surveys within the vicinity of the Project provided a comprehensive species list for the region.
Competency/experience of the team carrying out the survey	The survey team have more than 20 years of combined experience conducting fauna surveys in the Pilbara region of WA.
Scope and completeness	The scope was appropriate and complete.
Proportion of fauna recorded and/or collected, any identification issues	Based on species accumulation curves, a sufficient proportion of fauna was recorded for the study area
Access within the study area	Access within the study area was not restricted.
Timing, rainfall, season	Timing of the survey (Autumn season) was ideal and consistent with EPA (2020) guidance for the Eremaean Climatic Province.
Disturbance that may have affected the results of the survey	No disturbances affected the results of the survey.

6 DISCUSSION

6.1 VERTEBRATE FAUNA

6.1.1 Fauna habitats

All habitat types identified are typical of the Roebourne subregion and Uaroo land system (Table 3-1; Figure 3-2). Characterised by "broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered *Acacia* shrubs (Payne & Leighton 2004)," it represents more than 5% (7.02%) of the of the Pilbara Bioregion. Less than 1% of this (0.31%) is currently cleared for 'intensive use', 16% is in the conservation estate and 83.5% is used for pastoral activities (in the Pilbara Bioregion – Uaroo extends outside this region also). Thus, the fauna habitat within the study area is abundant and widespread throughout the Pilbara. No regionally restricted habitat types are present, and while the open woodlands show some local isolation within the study area, the most prominent open woodland habitat in the east is functionally connected, via diffuse drainages to open woodlands along the large drainage line approximately 2 km east of the study area.

6.1.2 Fauna assemblage

While the recorded fauna assemblage only represents 27.9% of the desktop assemblage (Table 5-5), this is accounted for by the small size of the study area (1,476 ha) and low diversity of fauna habitats present in the study area, compared to those present in the desktop search extent. The desktop search extent includes numerous habitats such as pelagic, littoral/coastal, estuarine, mangrove, salt flats, drainage, wetland, granite outcrop, banded ironstone ranges, major rivers and offshore islands. These habitats, which are not present in the study area, together support a much higher diversity than those present within the study area. For example, of the 218 species of bird identified in the desktop review, only 48 (22%) were recorded (Table 5-5), many of which are largely restricted to coastal/littoral, pelagic, mangroves, wetlands and mudflats; for this reason, at least 106 of these are highly unlikely to occur in the study area. Reptile diversity was highest of the major fauna classes (Table 5-5). Given that sandplains in the semi-arid and arid parts of WA are known to support high reptile diversity (Pianka and Goodyear, 2012).

Black Falcon (*Falco subniger*) was also recorded during the survey. This represents locally significant record. In WA, the Black Falcon is not listed as significant under the EPBC and/or BC Act. However, it is listed in other parts of its range: in New South Wales it is listed as VU under the BC Act (April 2023 list), in South Australia it is listed as Rare under the National Parks and Wildlife Act 1972 (January 2020 list), and in Victoria it is listed as CR under the Flora and Fauna Guarantee Act 1988 (June 2023 list) (DCCEEW 2023b).

6.1.3 Bilby

Having been previously recorded within the study area by Phoenix (2022b), it is no surprise that secondary evidence of the species was recorded throughout the study area during the current survey. While most of the secondary evidence identified was old (> 2 week), some recent Bilby sign was identified from odorous scats and loose sandy spoil associated with diggings that are indicative Bilby foraging activity. All recent scats and diggings were located near the northern boundary of the study area. Despite both intensive and extensive targeted survey effort (25 2 ha plot and 7 transects searches), no Bilby burrows (old, recently active, or active burrows) were located within the study area.

Bilby are known to utilise relatively large, moving home ranges in response to the scarcity of food resources in the semi-arid and arid parts of their range. While the study area clearly forms part of a

local population's home range, the absence of track sequences and wider spread of recent activity (indicative of current or very recent Bilby presence) within the study area, particularly the area near the northern boundary, may suggest that they have dispersed elsewhere, outside of the study area. However, this claim is speculative at best. Nevertheless, whether the local Bilby population is currently occupying the study area or not, it is likely to return given that it has been recorded on multiple occasions (albeit via secondary evidence; Phoenix, 2022b). Considering this, it is recommended that pre-clearance surveys for be conducted to detect active burrows prior to any clearing of native vegetation within the study area.

6.1.4 Mulgara

Mulgara were previously recorded in the study area and nearby. While no direct sightings of the species were recorded during the current survey, two recently active, or active burrows were recorded and subsequently targeted with Elliot traps but evaded capture. Given the dominance of suitable sandplain habitat within the study area it is recommended that pre-clearance surveys for the species be conducted to detect any active burrows of the species prior to clearing of native vegetation within the study area, concurrently with pre-clearance surveys for Bilby.

6.1.5 Grey Falcon

Grey falcons typically nest and roost along heavily wooded drainage lines. With large foraging home ranges, they predominantly prey on other bird species in flight from above. The breeding pair and single fledged juvenile were recorded perched on a transmission tower at the western end of the study area adjacent to the Alinta Power Station. Grey Falcons and numerous other birds of prey species frequently nest high up on transmission towers which provide nest security from predators and a vantage point from which to observe prey. The study area would only comprise a fraction of the resident Grey Falcons foraging home range and given the means with which they hunt their prey (on the wing) clearing of native vegetation for the Project, and subsequent project activities are unlikely negatively impact the pair.

6.1.6 Fork-tailed Swift

Fork tailed swifts are an almost exclusively aerial species and are therefore not limited by the availability of specific terrestrial habitats. As such, the species will not be affected from the clearing of native vegetation or Project related activities within the study area.

6.1.7 Osprey

The Osprey observed perching on a sign in the study area is not considered relevant to the proposed development of the Project. Ospreys are a predominantly coastal species but also forage in mangroves and other large water bodies where they almost exclusively prey on large fish. The habitats present within the study area are unlikely to provide any utility to the species and therefore will not be impacted by the Project.

6.2 SRE INVERTEBRATE FAUNA

Three SRE habitats were identified within the study area, primarily comprising low value sandplains (95.6%). The sandplains are considered low value SRE habitat as they are very dry environments, with limited shade, which are not conducive the SRE fauna.

Whilst the open woodland habitat seems locally isolated, it does extend eastward outside the study area and connects to larger open woodlands along drainage lines. This habitat type is well represented in the local area and within the Roebourne subregion, and as such is considered low value SRE habitat.

The SRE fauna of the region is well understood with several confirmed SRE species known in the area and a high number of records from several different SRE groups. The desktop review identified 7 confirmed SRE taxa and 78 potential SRE taxa from within the SRE desktop search area. Of these most were recorded in habitat types that aren't present in the study area, except for one record of Mygalomorph. This record was located approximately 165m from the southeastern boundary of the study area. During the field survey two mygalomorph specimens were collected that could not be identified as the sequencing failed. These records are cautiously determined potential SRE species.

Overall, the study area comprises extensive and mostly continuous low value SRE habitat. No confirmed SRE species were recorded within the study area, and it is unlikely any of the recorded potential SRE's are restricted to the study area.

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Appendix 1 Survey site locations

Sitename	Site type	Latitude	Longitude
BIE001	FS	-20.4110	118.5177
BIE002	FS	-20.4167	118.5326
BIE003	FS	-20.3913	118.5140
BIE004	FS	-20.4002	118.5110
BIE005	FS	-20.4010	118.5306
BIE006	FS	-20.4033	118.5328
BIE007	FS	-20.3866	118.5130
BIE008	FS	-20.3955	118.5066
BIE009	TSFS	-20.3912	118.5145
BIE010	TSFS	-20.4048	118.5079
BP001	TSFS	-20.4144	118.5127
BP002	TSFS	-20.4174	118.5336
BP003	TSFS	-20.3998	118.5113
BP004	TSFS	-20.4120	118.5189
BP005	TSFS	-20.3948	118.5175
BP006	TSFS	-20.3950	118.5197
BP007	TSFS	-20.4172	118.5328
BP008	TSFS	-20.4110	118.5179
BP009	TSFS	-20.4116	118.5141
BP010	TSFS	-20.4124	118.5107
BP011	TSFS	-20.4162	118.5094
BP012	TSFS	-20.4116	118.5119
BP013	TSFS	-20.4040	118.5075
BP014	TSFS	-20.3955	118.5064
BP015	TSFS	-20.3911	118.5139
BP016	TSFS	-20.3867	118.5126
BP017	TSFS	-20.4045	118.5319
BP018	TSFS	-20.4039	118.5297
BP019	TSFS	-20.4003	118.5302
BP020	TSFS	-20.3953	118.5283
BP021	TSFS	-20.3931	118.5304
BP022	TSFS	-20.3886	118.5239
BP023	TSFS	-20.3877	118.5266
BP024	TSFS	-20.4132	118.5263
BP025	TSFS	-20.3894	118.5249
BT001	TSFS	-20.4574	118.5276
BT002	TSFS	-20.3799	118.5440
BT003	TSFS	-20.3880	118.5159
BT004	TSFS	-20.4286	118.5277
BT005	TSFS	-20.4213	118.5513
BT006	TSFS	-20.3919	118.5288
BT007	TSFS	-20.4150	118.5215
Opp001	FS	-20.3980	118.5214
Opp002	IFS	-20.4162	118.5099
Opp003	IFS	-20.3964	118.5188
Opp004	IFS	-20.3962	118.5377
Opp005	IFS	-20.4050	118.5079
Opp006	IFS	-20.4116	118.5140
Opp007	IFS	-20.4162	118.5296
Opp008	IFS	-20.3964	118.5344
Opp009	IFS	-20.4018	118.5322
Opp010	IFS	-20.4005	118.5320
Opp011	IFS	-20.4074	118.5083
Opp012	IFS	-20.3986	118.5393
Opp013	FS	-20.3958	118.5150
Opp014	IFS	-20.3978	118.5302
Opp015	IFS	20.4242	118.5475
Opp016	IFS	-20.3772	118.5461

TSFS = Targeted species fauna site; FS = Fauna site; IFS = Individual specimen (fauna); BT = Bilby transect; BP = Bilby plot. Systematic sites are highlighted grey.

Appendix 2 Terrestrial fauna survey site descriptions

Appendix 3 Vertebrate fauna desktop and field survey results

Family	Species	Common name	Status	Introduced	Source					This survey
					EPBC PMST	NatureMap	PESDB	Past reports	DBCA TFA	
Amphibians (12)										
Hylidae	*Cyclorana australis*	Northern Snapping Frog				•		•		
	Cyclorana maini	Sheep Frog				•	•	•		
	Litoria caerulea	Green Tree Frog				•		•		
	Litoria rubella	Little Red Tree Frog				•	•	•		•
Limnodynastidae	*Neobatrachus aquilonius*	Northern Burrowing Frog				•	•			
	Neobatrachus sutor	Shoemaker Frog				•				
	Notaden nichollsi	Desert Spadefoot				•	•	•		•
	Platyplectrum spenceri	Centralian Burrowing Frog				•	•	•		
Myobatrachidae	*Uperoleia glandulosa*	Glandular Toadlet				•	•			
	Uperoleia russelli	Northwest Toadlet				•		•		
	Uperoleia saxatilis	Pilbara Toadlet				•				
	Uperoleia talpa	Ratcheting Toadlet				•				
Reptiles (94)										
Agamidae	*Amphibolurus gilberti*	Ta-ta				•				
	Ctenophorus caudicinctus	Ring-tailed Dragon				•		•		
	Ctenophorus isolepis	Central Military Dragon					•	•		•
	Ctenophorus nuchalis	Central Netted Dragon				•	•	•		•
	Ctenophorus reticulatus	Western Netted Dragon				•				
	Diporiphora paraconvergens	Grey-striped Western Desert Dragon				•				
	Diporiphora pindan	Pindan Dragon				•				
	Diporiphora valens	Southern Pilbara Tree Dragon				•				
	Diporiphora vescus	Northern Pilbara Tree Dragon				•				
	Gowidon longirostris	Long-nosed Dragon				•	•	•		•

	Pogona minor	Dwarf Bearded Dragon				•		•		
Carphodactylidae	*Nephrurus levis*	Smooth Knob-tailed Gecko				•	•	•		•
Colubridae	*Fordonia leucobalia*	White-bellied Mangrove Snake				•				
Diplodactylidae	*Diplodactylus bilybara*	Western Fat-tailed Gecko					•			•
	Diplodactylus conspicillatus	Fat-tailed Gecko				•		•		
	Lucasium stenodactylus	Sand-plain Gecko				•	•	•		•
	Rhynchoedura ornata	Western Beaked Gecko				•	•			
	Strophurus ciliaris	Northern Spiny-tailed Gecko				•	•	•		•
	Strophurus elderi	Jewelled Gecko				•				
	Strophurus jeanae	Southern Phasmid Gecko				•				•
Elapidae	*Acanthophis pyrrhus*	Desert Death Adder				•				
	Acanthophis wellsi	Pilbara Death Adder				•		•		
	Brachyurophis approximans	North-western Shovel-nosed Snake				•		•		
	Demansia reticulata	Reticulated Whipsnake				•		•		•
	Demansia rufescens	Rufous Whipsnake				•	•	•		•
	Furina ornata	Moon Snake				•		•		
	Pseudechis australis	Mulga Snake				•	•	•		•
	Pseudonaja mengdeni	Western Brown Snake				•	•	•		
	Pseudonaja modesta	Ringed Brown Snake				•		•		
	Pseudonaja nuchalis	Gwardar				•		•		
	Simoselaps anomalus	Desert Banded Snake				•		•		•
	Suta punctata	Spotted Snake				•				
Gekkonidae	*Gehyra pilbara*	Pilbara Dtella				•				
	Gehyra punctata	Spotted Dtella				•		•		
	Gehyra purpurascens	Purple Dtella				•				
	Gehyra variegata	Variegated Dtella				•	•	•		•
	Hemidactylus frenatus	Asian House Gecko			*	•				
	Heteronotia binoei	Bynoe's Gecko				•	•	•		
	Heteronotia spelea	Desert Cave Gecko				•				
Pygopodidae	*Delma butleri*	Unbanded Delma				•		•		•

	Delma haroldi	Neck-barred Delma				•		•		•
	Delma nasuta	Sharp-snouted Delma				•				•
	Delma pax	Peaceful Delma				•	•			•
	Delma tincta	Excitable Delma				•	•	•		
	Lialis burtonis	Burton's Legless Lizard				•				
	Pygopus nigriceps	Western Hooded Scaly-foot				•				
Pythonidae	*Antaresia childreni*	Children's Python				•				
	Antaresia perthensis	Pygmy Python				•				
	Aspidites melanocephalus	Black-headed Python				•	•	•		
	Aspidites ramsayi	Woma				•		•		
	Liasis olivaceus subsp. *barroni*	Pilbara Olive Python	VU (EPBC & BC Acts)		•	•			•	
Scincidae	*Carlia munda*	Shaded-litter Rainbow Skink				•		•		
	Carlia triacantha	Desert Rainbow Skink					•	•		•
	Cryptoblepharus buchananii	Buchanan's Snake-eyed Skink				•				
	Cryptoblepharus plagiocephalus	Peron's Snake-eyed Skink				•				•
	Ctenotus angusticeps	Airlie Island Ctenotus	P3 (DBCA list)			•			•	
	Ctenotus duricola	Eastern Pilbara Lined Ctenotus				•	•	•		•
	Ctenotus dux	Narrow-lined Ctenotus				•				
	Ctenotus grandis	Grand Ctenotus				•	•	•		•
	Ctenotus hanloni	Nimble Ctenotus				•	•			•
	Ctenotus helenae	Clay-soil Ctenotus				•	•	•		
	Ctenotus pantherinus	Leopard Ctenotus				•	•	•		•
	Ctenotus piankai	Pianka's Ctenotus				•	•	•		•
	Ctenotus rufescens	Rufous Fine-snout Ctenotus				•	•	•		•
	Ctenotus saxatilis	Rock Ctenotus				•	•	•		•
	Ctenotus serventyi	North-western Sandy-loam Ctenotus				•	•	•		•
	Egernia depressa	Southern Pygmy Spiny-tailed Skink				•	•	•		
	Egernia epsisolus	Eastern Pilbara Spiny-tailed Skink				•				
	Eremiascincus isolepis	Northern Bar-lipped Skink				•				
	Eremiascincus musivus	Mosaic Desert Skink						•		•

	Eremiascincus pallidus	Western Narrow-banded Skink				•		•		
	Eremiascincus richardsonii	Broad-banded Sand Swimmer				•				
	Lerista bipes	North-western Sandslider				•	•	•		•
	Lerista clara	Sharp-blazed Three-toed Slider				•				•
	Lerista muelleri	Wood Mulch-slider				•		•		
	Lerista verhmens	Powerful Three-toed Slider				•				
	Menetia greyii	Common Dwarf Skink				•	•	•		•
	Morethia ruficauda	Lined Firetail Skink				•	•	•		
	Notoscincus ornatus	Ornate Snake-eyed Skink				•				•
	Proablepharus reginae	Spinifex Snake-eyed Skink				•				
	Tiliqua multifasciata	Central Blue-tongue				•		•		•
Typhlopidae	*Anilios ammodytes*	Sand-diving Blind Snake				•		•		•
	Anilios grypus	Northern Beaked Blind Snake				•	•	•		
	Anilios pilbarensis	Pilbara Hook-snouted Blind Snake				•	•			
	Indotyphlops braminus	Flowerpot snake		*		•				
Varanidae	*Varanus acanthurus*	Spiny-tailed Monitor				•	•	•		•
	Varanus brevicauda	Short-tailed Pygmy Monitor				•	•	•		•
	Varanus bushi	Pilbara Mulga Monitor				•		•		
	Varanus eremius	Pygmy Desert Monitor				•	•	•		•
	Varanus giganteus	Perentie				•		•		
	Varanus gouldii	Sand Monitor				•	•	•		•
	Varanus panoptes	Yellow-spotted Monitor				•	•			
	Varanus pilbarensis	Pilbara Rock Monitor				•				
	Varanus tristis	Black-headed Monitor				•				
Birds (218)										
Acanthizidae	*Gerygone fusca*	Western Gerygone				•				
	Gerygone tenebrosa	Dusky Gerygone				•		•		
	Smicrornis brevirostris	Weebill				•				
Accipitridae	*Accipiter cirrocephalus*	Collared Sparrowhawk				•				
	Accipiter fasciatus	Brown Goshawk				•				

	Aquila audax	Wedge-tailed Eagle				•		•		•
	Circus approximans	Swamp Harrier				•		•		
	Circus assimilis	Spotted Harrier				•		•		•
	Elanus caeruleus	Black-shouldered Kite				•		•		•
	Haliaeetus leucogaster	White-bellied Sea-Eagle				•		•		
	Haliastur indus	Brahminy Kite				•	•	•		•
	Haliastur sphenurus	Whistling Kite				•		•		•
	Hieraaetus morphnoides	Little Eagle				•		•		
	Milvus migrans	Black Kite				•		•		
	Pandion cristatus	Osprey	Mig. (EPBC & BC Acts)		•	•		•	•	•
Acrocephalidae	*Acrocephalus australis*	Australian Reed Warbler				•				
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar				•		•		•
Alaudidae	*Mirafra javanica*	Horsfield's Bushlark				•	•	•		•
Anatidae	*Anas gracilis*	Grey Teal				•		•		
	Anas rhynchotis	Australasian Shoveler				•				
	Anas superciliosa	Pacific Black Duck				•		•		
	Aythya australis	Hardhead				•		•		
	Cygnus atratus	Black Swan				•		•		
	Dendrocygna arcuata	Wandering Whistling Duck				•				
	Dendrocygna eytoni	Plumed Whistling Duck				•		•		
	Malacorhynchus membranaceus	Pink-eared Duck				•		•		
Anhingidae	*Anhinga novaehollandiae*	Australasian Darter				•		•		
Apodidae	*Apus pacificus*	Fork-tailed Swift	Mig. (EPBC & BC Acts)		•	•	•		•	•
Ardeidae	*Ardea garzetta*	Little Egret				•	•	•		
	Ardea ibis	Cattle Egret				•		•		
	Ardea intermedia	Intermediate Egret				•				
	Ardea modesta	Great Egret				•		•		
	Ardea novaehollandiae	White-faced Heron			•	•	•	•		
	Ardea pacifica	White-necked Heron				•		•		
	Ardea sacra	Eastern Reef Egret				•		•		

	Butorides striata	Striated Heron				•		•		
	Nycticorax caledonicus	Rufous Night Heron				•				
Artamidae	*Artamus cinereus*	Black-faced Woodswallow				•	•	•		•
	Artamus cyanopterus	Dusky Woodswallow				•				
	Artamus leucorynchus	White-breasted Woodswallow				•	•	•		
	Artamus minor	Little Woodswallow				•				
	Artamus personatus	Masked Woodswallow				•				•
	Artamus superciliosus	White-browed Woodswallow				•		•		
Burhinidae	*Burhinus grallarius*	Bush Stone-curlew				•				
	Esacus magnirostris	Beach Stone-curlew				•				
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike				•	•	•		•
	Lalage tricolor	White-winged Triller				•		•		•
Caprimulgidae	*Eurostopodus argus*	Spotted Nightjar				•		•		•
Charadriidae	*Charadrius leschenaultii*	Greater Sand Plover	VU/Mig./VU (EPBC Act; BC Act)		•	•	•	•	•	
	Charadrius mongolus	Lesser Sand Plover	EN/Mig. (EPBC & BC Acts)		•		•	•	•	
	Charadrius ruficapillus	Red-capped Plover				•	•	•		
	Charadrius veredus	Oriental Plover	Mig. (EPBC & BC Acts)		•	•		•	•	
	Elseyornis melanops	Black-fronted Dotterel				•	•	•		
	Erythrogonys cinctus	Red-kneed Dotterel				•		•		
	Pluvialis fulva	Pacific Golden Plover	Mig. (EPBC & BC Acts)		•	•			•	
	Pluvialis squatarola	Grey Plover	Mig. (EPBC & BC Acts)		•	•		•	•	
	Vanellus miles	Masked Lapwing				•	•			
	Vanellus tricolor	Banded Lapwing				•		•		
Ciconiidae	*Ephippiorhynchus asiaticus*	Black-necked Stork				•	•	•		
Cinclosomatidae	*Cinclosoma castaneothorax*	Chestnut-breasted Quail-thrush				•				
Columbidae	*Columba livia*	Domestic Pigeon		*		•		•		
	Geopelia cuneata	Diamond Dove				•	•	•		•
	Geopelia humeralis	Bar-shouldered Dove				•				
	Geopelia placida	Peaceful Dove					•	•		
	Geopelia striata	Zebra Dove				•				•

	Geophaps plumifera	Spinifex Pigeon				•		•		
	Ocyphaps lophotes	Crested Pigeon				•	•	•		•
	Phaps chalcoptera	Common Bronzewing				•	•	•		
	Phaps histrionica	Flock Bronzewing				•				•
Corvidae	*Corvus bennetti*	Little Crow				•				
	Corvus coronoides	Australian Raven				•				
	Corvus orru	Torresian Crow				•	•	•		•
Cracticidae	*Cracticus nigrogularis*	Pied Butcherbird				•		•		
	Gymnorhina tibicen	Australian Magpie				•				
	Centropus phasianinus	Pheasant Coucal						•		
	Chalcites basalis	Horsfield's Bronze Cuckoo				•		•		•
	Chalcites osculans	Black-eared Cuckoo				•				
Cuculidae	*Heteroscenes pallidus*	Pallid Cuckoo				•		•		•
Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird				•				
Dromaiidae	*Dromaius novaehollandiae*	Emu				•		•		
Estrildidae	*Emblema pictum*	Painted Finch				•		•		
	Heteromunia pectoralis	Pictorella Mannikin				•				
	Neochmia ruficauda	Star Finch				•				
	Taeniopygia castanotis	Zebra Finch				•	•	•		•
Falconidae	*Falco berigora*	Brown Falcon				•	•	•		•
	Falco cenchroides	Australian Kestrel				•	•	•		•
	Falco hypoleucos	Grey Falcon	VU (BC Act)		•	•			•	•
	Falco longipennis	Australian Hobby				•		•		
	Falco peregrinus	Peregrine Falcon	OS (BC Act)			•			•	
	Falco subniger	Black Falcon								•
Fregatidae	*Fregata ariel*	Lesser Frigatebird	Mig. (EPBC & BC Acts)		•	•		•	•	
	Fregata minor	Great Frigatebird	Mig. (EPBC & BC Acts)		•					
Glareolidae	*Glareola maldivarum*	Oriental Pratincole	Mig. (EPBC & BC Acts)		•	•			•	
	Stiltia isabella	Australian Pratincole				•				
Gruidae	*Grus rubicunda*	Brolga				•				

Haematopodidae	*Haematopus fuliginosus*	Sooty Oystercatcher				•		•		
	Haematopus longirostris	Pied Oystercatcher				•		•		
Halcyonidae	*Dacelo leachii*	Blue-winged Kookaburra				•		•		•
	Todiramphus chloris	Collared Kingfisher				•		•		
	Todiramphus pyrrhopygius	Red-backed Kingfisher				•		•		•
	Todiramphus sanctus	Sacred Kingfisher				•	•	•		
Hirundinidae	*Cheramoeca leucosterna*	White-backed Swallow				•		•		
	Hirundo neoxena	Welcome Swallow				•	•			•
	Hirundo rustica	Barn Swallow	Mig. (EPBC & BC Acts)		•	•			•	
	Petrochelidon ariel	Fairy Martin				•	•	•		
	Petrochelidon nigricans	Tree Martin				•		•		•
Hydrobatidae	*Oceanites oceanicus*	Wilson's Storm Petrel	Mig. (EPBC & BC Acts)			•			•	
Laridae	*Anous stolidus*	Common Noddy	Mig. (EPBC & BC Acts)		•					
	Chlidonias leucopterus	White-winged Black Tern	Mig. (EPBC & BC Acts)						•	
	Gelochelidon nilotica	Gull-billed Tern	Mig. (BC Act)			•	•	•	•	
	Hydroprogne caspia	Caspian Tern	Mig. (EPBC & BC Acts)		•	•		•	•	
	Larus novaehollandiae	Silver Gull				•	•	•		
	Onychoprion anaethetus	Bridled Tern	Mig. (EPBC & BC Acts)			•			•	
	Sterna bengalensis	Lesser Crested Tern				•		•		
	Sterna hirundo	Common Tern	Mig. (EPBC & BC Acts)			•			•	
	Sterna hybrida	Whiskered Tern				•		•		
	Sternula albifrons	Little Tern	Mig. (EPBC & BC Acts)		•	•	•		•	
	Sterna nereis subsp. *nereis*	Fairy Tern	VU (EPBC & BC Acts)		•	•		•	•	
	Thalasseus bergii	Crested Tern	Mig. (BC Act)			•		•	•	
Locustellidae	*Cincloramphus cruralis*	Brown Songlark				•	•	•		•
	Cincloramphus mathewsi	Rufous Songlark				•		•		
	Eremiornis carteri	Spinifex-bird				•	•	•		
Maluridae	*Malurus assimilis*	Purple-backed Fairy-wren				•		•		•
	Malurus leucopterus	White-winged Fairy-wren				•	•	•		•
	Stipiturus ruficeps	Rufous-crowned Emu-wren				•				

Meliphagidae	*Epthianura aurifrons*	Orange Chat				•				
	Epthianura tricolor	Crimson Chat				•				
	Gavicalis virescens	Singing Honeyeater				•	•	•		•
	Lichmera indistincta	Brown Honeyeater				•	•	•		
	Manorina flavigula	Yellow-throated Miner				•	•	•		•
	Melithreptus gularis	Black-chinned Honeyeater				•				
	Ptilotula keartlandi	Grey-headed Honeyeater				•				
	Ptilotula penicillata	White-plumed Honeyeater				•	•	•		•
	Sugomel nigrum	Black Honeyeater						•		
Meropidae	*Merops ornatus*	Rainbow Bee-eater				•	•	•		•
Monarchidae	*Grallina cyanoleuca*	Magpie-lark				•	•	•		•
Motacillidae	*Anthus australis*	Australian Pipit				•	•	•		•
	Motacilla cinerea	Grey Wagtail	Mig. (EPBC & BC Acts)		•					
	Motacilla flava	Yellow Wagtail	Mig. (EPBC & BC Acts)		•	•			•	
Oreoicidae	*Oreoica gutturalis*	Crested Bellbird				•				
Otididae	*Ardeotis australis*	Australian Bustard				•		•		•
Pachycephalidae	*Colluricincla harmonica*	Grey Shrike-thrush				•		•		
	Pachycephala lanioides	White-breasted Whistler				•		•		
	Pachycephala melanura	Mangrove Golden Whistler				•		•		
	Pachycephala rufiventris	Rufous Whistler				•				
Pardalotidae	*Pardalotus rubricatus*	Red-browed Pardalote				•		•		•
	Pardalotus striatus	Striated Pardalote				•				
Passeridae	*Passer montanus*	Eurasian Tree Sparrow		*		•				
Pelecanidae	*Pelecanus conspicillatus*	Australian Pelican				•		•		
Petroicidae	*Peneothello pulverulenta*	Mangrove Robin				•		•		
	Petroica goodenovii	Red-capped Robin				•				
Phalacrocoracidae	*Phalacrocorax carbo*	Great Cormorant				•				
	Phalacrocorax melanoleucos	Little Pied Cormorant				•		•		
	Phalacrocorax sulcirostris	Little Black Cormorant				•				
	Phalacrocorax varius	Pied Cormorant				•		•		

Phasianidae	*Synoicus ypsilophora*	Brown Quail				•	•	•		
Podargidae	*Podargus strigoides*	Tawny Frogmouth				•		•		
Podicipedidae	*Podiceps cristatus*	Great Crested Grebe				•				
	Poliocephalus poliocephalus	Hoary-headed Grebe				•				
	Tachybaptus novaehollandiae	Australasian Grebe				•		•		
Pomatostomidae	*Pomatostomus superciliosus*	White-browed Babbler				•				
	Pomatostomus temporalis	Grey-crowned Babbler				•				
Procellariidae	*Calonectris leucomelas*	Streaked Shearwater	Mig. (EPBC & BC Acts)		•					
	Macronectes giganteus	Southern Giant Petrel	EN/Mig./Mig. (EPBC Act; BC Act)		•					
Psittacidae	*Cacatua roseicapilla*	Galah				•	•	•		
	Cacatua sanguinea	Little Corella				•	•	•		•
	Melopsittacus undulatus	Budgerigar				•	•	•		•
	Nymphicus hollandicus	Cockatiel				•	•	•		•
	Pezoporus occidentalis	Night Parrot	EN/CR (EPBC Act; BC Act)		•					
	Platycercus spurius	Red-capped Parrot				•				
	Platycercus zonarius	Australian Ringneck			•	•				
Ptilonorhynchidae	*Ptilonorhynchus maculatus*	Spotted Bowerbird				•				
Rallidae	*Fulica atra*	Eurasian Coot				•				
	Gallirallus philippensis	Buff-banded Rail				•	•			
	Porphyrio porphyrio	Purple Swamphen				•				
	Porzana fluminea	Australian Spotted Crake				•				
	Tribonyx ventralis	Black-tailed Native-hen				•				
Recurvirostridae	*Cladorhynchus leucocephalus*	Banded Stilt				•		•		
	Himantopus himantopus	Black-winged Stilt				•	•	•		
	Recurvirostra novaehollandiae	Red-necked Avocet				•				
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail				•				•
	Rhipidura leucophrys	Willie Wagtail				•	•	•		•
	Rhipidura phasiana	Mangrove Grey Fantail				•		•		
Rostratulidae	*Rostratula australis*	Australian Painted Snipe	EN (EPBC & BC Acts)		•					
Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	Mig. (EPBC & BC Acts)		•	•		•	•	

	Arenaria interpres	Ruddy Turnstone	Mig. (EPBC & BC Acts)		•	•	•	•	•	
	Calidris acuminata	Sharp-tailed Sandpiper	Mig. (EPBC & BC Acts)		•	•			•	
	Calidris alba	Sanderling	Mig. (EPBC & BC Acts)		•			•	•	
	Calidris canutus	Red Knot	EN/Mig./EN (EPBC Act; BC Act)		•	•	•	•	•	
	Calidris falcinellus	Broad-billed Sandpiper	Mig. (BC Act)		•	•		•	•	
	Calidris ferruginea	Curlew Sandpiper	CR/Mig./CR (EPBC Act; BC Act)		•	•	•	•	•	
	Calidris melanotos	Pectoral Sandpiper	Mig. (EPBC & BC Acts)		•	•			•	
	Calidris pugnax	Ruff	Mig. (EPBC & BC Acts)			•			•	
	Calidris ruficollis	Red-necked Stint	Mig. (EPBC & BC Acts)			•	•	•	•	
	Calidris subminuta	Long-toed Stint	Mig. (EPBC & BC Acts)		•	•			•	
	Calidris tenuirostris	Great Knot	CR/Mig./CR (EPBC Act; BC Act)		•	•	•	•	•	
	Gallinago stenura	Pin-tailed Snipe	Mig. (EPBC & BC Acts)			•			•	
	Limnodromus semipalmatus	Asian Dowitcher	Mig. (EPBC & BC Acts)		•	•			•	
	Limosa lapponica	Bar-tailed Godwit	Mig. (EPBC & BC Acts)		•	•	•	•	•	
	Limosa limosa	Black-tailed Godwit	Mig. (BC Act)		•	•			•	
	Numenius madagascariensis	Eastern Curlew	CR/Mig./CR (EPBC Act; BC Act)		•	•	•	•	•	
	Numenius minutus	Little Curlew	Mig. (EPBC & BC Acts)		•	•		•	•	
	Numenius phaeopus	Whimbrel	Mig. (EPBC & BC Acts)		•	•	•	•	•	
	Phalaropus lobatus	Red-necked Phalarope	Mar/Mig. (EPBC Act; BC Act)		•	•			•	
	Tringa brevipes	Grey-tailed Tattler	Mig. EPBC and BC Acts; P4 DBCA list		•	•	•	•	•	
	Tringa glareola	Wood Sandpiper	Mig. (EPBC & BC Acts)		•	•	•		•	
	Tringa nebularia	Common Greenshank	Mig. (EPBC & BC Acts)		•	•		•	•	
	Tringa stagnatilis	Marsh Sandpiper	Mig. (EPBC & BC Acts)		•	•		•	•	
	Xenus cinereus	Terek Sandpiper	Mig. (EPBC & BC Acts)		•	•	•	•	•	
Strigidae	*Ninox connivens*	Barking Owl				•				
Sulidae	*Sula leucogaster*	Brown Booby	Mig. (EPBC & BC Acts)		•	•			•	
Threskiornithidae	*Platalea flavipes*	Yellow-billed Spoonbill				•				
	Platalea regia	Royal Spoonbill				•				
	Plegadis falcinellus	Glossy Ibis	Mig. (EPBC & BC Acts)			•			•	
	Threskiornis moluccus	Australian White Ibis				•	•	•		

	Threskiornis spinicollis	Straw-necked Ibis				•	•	•		
Turnicidae	*Turnix velox*	Little Button-quail				•	•	•		•
Tytonidae	*Tyto alba*	Barn Owl				•		•		•
Zosteropidae	*Zosterops luteus*	Yellow White-eye				•		•		
Mammals (45)										
Bovidae	*Bos taurus*	European Cattle		*		•	•	•		
	Capra hircus	Goat		*		•				
Camelidae	*Camelus dromedarius*	Dromedary camel		*		•				
Canidae	*Canis familiaris*	Dog		*		•	•	•		
	Vulpes vulpes	Red Fox		*		•	•	•		•
Dasyuridae	*Antechinomys laniger*	Kultarr				•				
	Dasycercus blythi	Brush-tailed Mulgara	P4 (DBCA list)			•	•		•	•
	Dasykaluta rosamondae	Little Red Kaluta				•	•	•		•
	Dasyurus hallucatus	Northern Quoll	EN (EPBC & BC Acts)		•	•			•	
	Ningaui timealeyi	Pilbara Ningaui				•				
	Planigale ingrami	Long-tailed Planigale				•				
	Pseudantechinus woolleyae	Woolley's Pseudantechinus				•				
	Sminthopsis macroura	Stripe-faced Dunnart				•				
	Sminthopsis youngsoni	Lesser Hairy-footed Dunnart				•	•	•		•
Emballonuridae	*Saccolaimus flaviventris*	Yellow-bellied Sheath-tailed Bat				•		•		
	Taphozous georgianus	Common Sheath-tailed Bat				•		•		
Equidae	*Equus asinus*	Donkey		*		•				
	Equus caballus	Horse		*		•		•		
Felidae	*Felis catus*	Cat		*		•	•	•		•
Leporidae	*Oryctolagus cuniculus*	Rabbit		*		•		•		
	Osphranter robustus	Euro				•		•		
Macropodidae	*Osphranter rufus*	Red Kangaroo					•			•
	Petrogale rothschildi	Rothschild's Rock-wallaby				•				
Megadermatidae	*Macroderma gigas*	Ghost Bat	VU (EPBC & BC Acts)		•	•			•	
Molossidae	*Chaerephon jobensis*	Greater Northern Freetail-bat				•	•	•		•

	Ozimops cobourgianus	North-western Free-tailed Bat	P1 (DBCA list)			•		•	•	
	Ozimops lumsdenae	Northern Free-tailed Bat						•		
Muridae	*Mus musculus*	House Mouse		*		•		•		
	Notomys alexis	Spinifex Hopping-mouse				•	•	•		•
	Pseudomys chapmani	Western Pebble-mound Mouse	P4 (DBCA list)			•			•	
	Pseudomys delicatulus	Delicate Mouse				•				
	Pseudomys desertor	Desert Mouse				•				
	Pseudomys hermannsburgensis	Sandy Inland Mouse				•	•	•		•
	Pseudomys nanus	Western Chestnut Mouse				•		•		
	Rattus rattus	Black Rat		*		•				
	Zyzomys argurus	Common Rock-rat				•		•		
Pteropodidae	*Pteropus scapulatus*	Little Red Flying-fox				•		•		
Rhinonycteridae	*Rhinonicteris aurantia* (Pilbara)	Pilbara Leaf-nosed Bat	VU (EPBC & BC Acts)		•	•			•	
Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked Echidna				•				•
Thylacomyidae	*Macrotis lagotis*	Greater Bilby	VU (EPBC & BC Acts)		•	•	•		•	•
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat				•	•	•		•
	Nyctophilus arnhemensis	Arnhem Land Long-eared Bat				•		•		
	Nyctophilus geoffroyi	Lesser Long-eared Bat				•		•		•
	Scotorepens greyii	Little Broad-nosed Bat				•	•	•		•
	Vespadelus finlaysoni	Finlayson's Cave Bat				•	•	•		•

Rows highlighted in grey indicate significant records during the survey

Appendix 4 Short-range endemic invertebrate desktop results

Higher taxon, family	Species	SRE category	Nearest record (km)	Habitat records
Class Arachnida, infraorder Araneomorphae (Selenopid spiders) (4)				
Selenopidae	*Karaops* `aurizon`	Potential	71.5	Footslope
	Karaops `sp. indet.`	Uncertain	50.0	
	Karaops kariyarra	Confirmed	38.0	Breakaway, ridge
	Karaops nyiyaparli	Widespread	50.8	East facing ridge
Class Arachnida, infraorder Mygalomorphae (trapdoor spiders) (38)				
Actinopodidae	*Missulena* `sp. 8`	Potential	45.3	
	Missulena `sp. indet.`	Uncertain	7.3	
	Missulena rutraspina	Widespread	61.2	
Anamidae	*`MYGAAB`* `sp. indet.`	Uncertain	40.3	
	Aname `mainae`	Widespread	80.2	
	Aname `MYG001 group, mellosa?`	Potential	68.7	
	Aname `MYG372`	Potential	74.9	Drainage line
	Aname `MYG373`	Potential	0.7	Sandplain
	Aname `MYG682`	Potential	73.4	
	Aname `MYG770`	Potential	86.6	
	Aname `sp. indet.`	Uncertain	1.8	Sandplain, drainage line
	Aname baileyorum	Widespread	55.3	Drainage line
	Aname ellenae	Widespread	35.6	
	Aname frostorum	Confirmed	84.8	
	Aname mcalpinei	Confirmed	0.2	Shrubland on sandplain
	Aname mellosa	Widespread	73.6	Drainage line, breakaway
	Aname sinuata	Widespread	2.2	
	Anamidae `sp. indet.`	Uncertain	40.3	
	Kwonkan `MYG007`	Potential	0.7	Acacia shrubland on sandplain
	Kwonkan `MYG089`	Potential	48.3	
	Kwonkan `MYG092`	Potential	80.9	
	Kwonkan `MYG209`	Potential	8.5	Acacia shrubland on sandplain
	Kwonkan `sp. indet.`	Uncertain	38.8	
Barychelidae	*Aurecocrypta* `chichester`	Widespread	94.8	
	Aurecocrypta `MYG318`	Potential	93.9	East facing ridge
	Barychelidae `sp. indet.`	Uncertain	73.4	
	Synothele `MYG115`	Potential	91.3	
	Synothele `MYG127`	Widespread	95.1	Gully
	Synothele `MYG334`	Potential	94.9	
	Synothele `sp. indet.`	Uncertain	41.7	Ironstone gorge
	Synothele `xkarara`	Potential	81.2	
Halonoproctidae	*Conothele* `MYG541`	Potential	6.8	Hummock grassland
	Conothele `MYG607`	Potential	71.6	
	Conothele `sp. indet.`	Uncertain	94.1	

Higher taxon, family	Species	SRE category	Nearest record (km)	Habitat records
Idiopidae	`Aganippe` `MYG084`	Potential	8.5	Acacia, Spinifex on sandplain
	`Aganippe` `sp. indet.`	Uncertain	68.5	
	`Aganippe` occidentale	Potential	38.9	
	Idiopidae `sp. indet.`	Uncertain	17.4	
Class Arachnida, order Opiliones (Harvestmen spiders) (2)				
Assamiidae	Assamiidae `sp. indet.`	Uncertain	34.9	
	Dampetrus `sp. indet.`	Uncertain	34.0	
Class Arachnida, order Pseudoscorpiones (Pseudoscorpions) (39)				
Atemnidae	*Anatemnus* `sp. indet.`	Uncertain	103.4	
	Oratemnus `PSE060`	Potential	65.5	
	Oratemnus `sp. indet.`	Uncertain	20.0	Drainage line, breakaway, under Ficus
Cheiridiidae	`PSEAAB` `sp. indet.`	Uncertain	75.3	Ficus on ridge
	Apocheiridium `sp. indet.`	Uncertain	53.1	Granite outcrop
	Cheiridiidae `sp. indet.`	Uncertain	79.4	Gully
Chernetidae	`PSEAAF` `PSE-A`	Potential	67.3	Under eucalyptus bark
	`PSEAAF` `sp. indet.`	Uncertain	89.1	Under bark of *Corymbia hamersleyana*
	Austrochernes `sp. nov. 001`	Potential	50.8	South facing ridge
	Sundochernes `PSE021`	Potential	53.1	Granite outcrop
	Austrochthonius `PSE135, pilbara`	Widespread	50.0	Under Ficus
	Austrochthonius `sp. indet.`	Uncertain	94.1	Gorge, gully
	Tyrannochthonius `sp. nov. near aridus`	Potential	52.4	Gorge, gully
	Tyrannochthonius aridus	Widespread	1.9	Under Ficus on ridge
Feaellidae	*Feaella tealei*	Confirmed	100.5	Under rocks
Garypidae	*Synsphyronus* `PSE008`	Potential	86.0	Granite outcrop
	Synsphyronus `PSE012`	Potential	82.2	Under Ficus
	Synsphyronus `PSE094, long chelal hand`	Potential	38.0	Low ridge
	Synsphyronus `PSE128`	Potential	63.1	Ficus on ridge, in gully
	Synsphyronus `sp. indet.`	Uncertain	81.4	Under bark and rocks
	Synsphyronus heptatrichus	Widespread	63.1	Ficus on ridge
	Synsphyronus xynus	Widespread	88.2	Under bark of *Corymbia hamersleyana*
Garypinidae	*Solinus* `PSE222`	Potential	87.6	Under eucalyptus bark
Hyidae	*Indohya* `PSE002`	Potential	50.6	Drainage line, gorge, ridge
Olpiidae	*`Genus 7/4`* `sp. indet.`	Uncertain	11.9	Shrubland on sandplain
	`PSEAAA` `sp. indet.`	Uncertain	50.6	Under Ficus
	Austrohorus `sp. indet.`	Uncertain	1.8	Under Ficus, ridge
	Beierolpium `sp. 8/2`	Widespread	26.9	Under Ficus, outcrop
	Beierolpium `sp. 8/3`	Widespread	0.7	Drainage line, breakaway, sandplain
	Beierolpium `sp. 8/4 lge`	Potential	8.9	Under Ficus, eucalyptus woodland
	Beierolpium `sp. 8/4 small`	Potential	8.6	*Melaleuca* sandplain

Higher taxon, family	Species	SRE category	Nearest record (km)	Habitat records
	Beierolpium `sp. 8/4`	Potential	50.7	South facing ridge
	Beierolpium `sp. indet.`	Uncertain	2.7	Drainage depression
	Indolpium `long chelal hand`	Potential	77.0	Under rocks beneath Ficus tree
	Indolpium `sp. indet.`	Uncertain	0.7	Gully, ridge, sandplain
	Linnaeolpium `sp. indet.`	Uncertain	76.5	Under Ficus
	Olpiidae `sp. indet.`	Uncertain	7.3	Shrubland on sandplain
Sternophoridae	*Afrosternophorus* `sp. indet.`	Uncertain	34.0	Outcrop, gully
Syarinidae	*Ideoblothrus* `sp. Ord Ranges`	Potential	61.5	
Class Arachnida, order Scorpiones (Scorpions) (42)				
Buthidae	Buthidae `sp. indet.`	Uncertain	2.2	
	Isometroides `sp. 2`	Potential	87.7	
	Lychas `adonis`	Widespread	2.2	*Melaleuca* sandplain
	Lychas `annulatus complex`	Potential	88.3	Drainage line
	Lychas `bituberculatus complex`	Potential	53.1	Granite outcrop, Ficus on ridge
	Lychas `bituberculatus group`	Potential	79.4	
	Lychas `gracilimanus`	Potential	90.0	
	Lychas `hairy tail complex`	Potential	56.0	Granite outcrop
	Lychas `hairy tail group`	Potential	81.2	
	Lychas `hairy tail`	Potential	64.0	Under Ficus
	Lychas `harveyi`	Widespread	74.9	Drainage line
	Lychas `macleod`	Potential	94.3	
	Lychas `multipunctatus complex`	Potential	91.4	
	Lychas `multipunctatus`	Widespread	1.8	Drainage line, breakaway
	Lychas `pilbara 1`	Widespread	94.1	
	Lychas `sp. 1`	Widespread	72.5	
	Lychas `sp. 2`	Widespread	38.5	
	Lychas `sp. 3`	Potential	113.9	
	Lychas `sp. 4`	Widespread	61.2	
	Lychas `sp. 5`	Potential	52.9	
	Lychas `sp. 6`	Widespread	75.5	
	Lychas `sp. indet.`	Uncertain	8.5	Drainage line, breakaway, ridge
	Lychas annulatus	Widespread	48.4	
	Lychas bituberculatus	Widespread	23.3	Plain, drainage depression
Urodacidae	*Urodacus* `armatus`	Potential	5.9	
	Urodacus `pilbara 13`	Widespread	1.8	Sandplain with low *Acacia*/grasses
	Urodacus `pilbara 4`	Widespread	81.4	
	Urodacus `Pilbara 5`	Widespread	56.0	Drainage line
	Urodacus `pilbara 8`	Widespread	93.3	
	Urodacus `SCO010, pearcei`	Potential	94.3	
	Urodacus `SCO028`	Potential	95.5	
	Urodacus `SCO034, Pilbara sp. 2`	Potential	77.6	

Higher taxon, family	Species	SRE category	Nearest record (km)	Habitat records
	Urodacus `SCO035, pilbara sp. 2`	Potential	70.6	Drainage line
	Urodacus `SCO057, Pilbara sp. 2`	Potential	73.6	
	Urodacus `sp. 5`	Widespread	123.8	
	Urodacus `sp. 6`	Widespread	91.3	
	Urodacus `sp. 7`	Widespread	45.5	
	Urodacus `sp. indet.`	Uncertain	2.7	
	Urodacus `sp. Pilbara 3`	Widespread	80.9	
	Urodacus `sp. Pilbara 8`	Widespread	94.9	
	Urodacus hoplurus	Widespread	7.3	
	Urodacus varians	Widespread	26.7	Eucalypt over *Triodia pungens*
Class Chilopoda (Centipedes) (4)				
Chilenophilidae	*Sepedonophilus* `sp. indet.`	Uncertain	106.1	
Geophilidae	Geophilidae `sp. indet.`	Uncertain	98.3	
Scutigeridae	*Pilbarascutigera* `sp. indet.`	Uncertain	74.0	
	Pilbarascutigera incola	Widespread	15.3	
Class Diplopoda (Millipedes) (18)				
Paradoxosomatidae	`DIPAAC` `DIP030`	Potential	80.9	
	Antichiropus `DIP005, abydos`	Potential	93.9	Drainage line
	Antichiropus `DIP033, wodgina`	Potential	64.4	Under Ficus
	Antichiropus `DIP037, balfour1`	Potential	113.9	
	Antichiropus `sp. indet.`	Uncertain	38.3	North facing gully
	Antichiropus apricus	Confirmed	96.6	
	Antichiropus forcipatus	Confirmed	72.6	Gully, drainage line, sandstone gorge
	Antichiropus patriciae	Widespread	45.3	
	Antichiropus salutus	Potential	80.9	
	Antichiropus simmonsi	Confirmed	61.2	
	Orthomorpha coarctata	Widespread	10.6	In & under pot plants
	Paradoxosomatidae `sp. indet.`	Uncertain	57.0	Under Ficus
Polyxenidae	Polyxenidae `sp. indet.`	Uncertain	81.0	
	Unixenus `mjoebergi complex`	Potential	50.9	
	Unixenus mjoebergi	Potential	7.3	Under stones on beach
Synxenidae	Synxenidae `sp. indet.`	Uncertain	13.4	
Trigoniulidae	*Austrostrophus* `sp. indet.`	Uncertain	93.9	Ironstone/sandstone gorge, gully
	Austrostrophus stictopygus	Widespread	93.9	Ironstone/sandstone gorge, gully
Class Malacostraca, order Isopoda (Isopods) (18)				
Armadillidae	*Acanthodillo* `sp. indet.`	Uncertain	8.5	
	Buddelundia `sp. 10`	Widespread	0.8	*Acacia* spinifex sandplain, minor drainage line
	Buddelundia `sp. 11`	Potential	93.6	Gully, gorge
	Buddelundia `sp. 13`	Widespread	74.9	Drainage line
	Buddelundia `sp. 14`	Widespread	8.6	Ficus on ridge, outcrop, drainage line

Higher taxon, family	Species	SRE category	Nearest record (km)	Habitat records
	Buddelundia `sp. 14re`	Potential	53.1	Granite outcrop
	Buddelundia `sp. 17`	Potential	8.5	Sandplain, ridge
	Buddelundia `sp. 18`	Widespread	88.3	Sandstone/ironstone gorge, ridge
	Buddelundia `sp. 19`	Potential	2.3	Sandplain, drainage line
	Buddelundia `sp. 21`	Potential	50.6	Under Ficus, south facing ridge
	Buddelundia `sp. 31`	Potential	53.1	Ridge, granite outcrop
	Buddelundia `sp. 36`	Widespread	64.0	Ficus on ridge
	Buddelundia `sp. indet.`	Uncertain	76.7	
	Buddelundiinae `sp. indet.`	Uncertain	52.4	
	Buddelundiinae abydos	Widespread	94.0	Gorge, gully
	Spherillo `sp. indet.`	Uncertain	88.3	Drainage line
	Spherillo wodgina	Potential	8.6	Outcrop, drainage line
Philosciidae	*Laevophiloscia* `sp. indet.`	Uncertain	76.2	Breakaway
Class Gastropoda (Land snails) (40)				
Camaenidae	Camaenidae `sp. indet.`	Uncertain	7.9	
	Camaenidae cf. `Mount Robinson` n.sp.	Potential	64.0	Under rocks and leaf litter on outcrop
	Camaenidae cf. `Z` n.sp.	Potential	81.5	Under rocks and leaf litter on ridge
	Camaenidae n.sp.	Potential	63.6	Under Ficus, outcrop, ridge
	Quistrachia `Depuch Island` n.sp.	Potential	84.7	
	Quistrachia herberti	Potential	102.3	
	Quistrachia turneri	Potential	91.0	Granite outcrop
	Rhagada `sp. indet.`	Uncertain	0.0	
	Rhagada aff. *Richardsonii*	Potential	95.9	Drainage line
	Rhagada cf. *convicta*	Widespread	42.6	Limestone ridge, ancient sand dune
	Rhagada cf. *richardsonii*	Widespread	27.5	Drainage line
	Rhagada convicta	Widespread	46.3	Under and among roots of *Triodia*
	Rhagada radleyi	Widespread	95.6	
	Rhagada richardsonii	Widespread	15.1	Under green *Triodia*
	Rhagada sp. `med banded`	Potential	103.1	
	Rhagada sp. `Sulpher Springs`	Potential	99.8	
	Rhagada tescorum	Widespread	46.3	
Geomitridae	*Cochlicella acuta*	Widespread	89.8	Spinifex plain
Helicidae	*Theba pisana*	Potential	92.9	Shrubland
Helicodiscidae	*Stenopylis* cf. *coarctata*	Potential	94.8	Drainage line
	Stenopylis coarctata	Widespread	35.3	Drainage line
Pupillidae	*Gastrocopta* `sp. indet.`	Uncertain	96.5	Sandstone gorge
	Gastrocopta cf. *larapinta*	Widespread	35.3	Drainage line
	Gastrocopta cf. *mussoni*	Widespread	7.3	
	Gastrocopta hedleyi	Widspread	84.6	
	Gastrocopta larapinta	Widspread	62.8	Breakaway, drainage line

Higher taxon, family	Species	SRE category	Nearest record (km)	Habitat records
	Gastrocopta mussoni	Widspread	20.0	Ridge, gully, drainage line
	Pupoides `sp. indet.`	Uncertain	35.3	
	Pupoides beltianus	Widespread	2.3	
	Pupoides cf. *beltianus*	Widespread	2.3	Outcrop, under Ficus
	Pupoides cf. *contrarius*	Widespread	7.3	
	Pupoides cf. *eremicolus*	Widespread	2.9	
	Pupoides cf. *lepidulus*	Widespread	7.3	
	Pupoides cf. *pacificus*	Widespread	64.4	Ficus on ridge
	Pupoides contrarius	Widespread	2.9	Limestone
	Pupoides eremicolus	Widespread	88.5	Breakaway
	Pupoides lepidulus	Widespread	2.9	Red soil, spinifex
	Pupoides pacificus	Widespread	2.3	Drainage line, gorge
Subulinidae	*Eremopeas interioris*	Widespread	23.3	Drainage line, breakaway
	Succinea `sp. indet.`	Uncertain	8.0	Drainage

Appendix 5 Exhaustive likelihood of occurrence list including rationale behind categorisation

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
Reptiles (5)										
Chelonia mydas Green Turtle	VU/Mig./VU (EPBC Act; BC Act)	Historical written record	6.0 km NNE	Marine	Marine environments	Unlikely	Historic records may not represent current species distribution	The location is close, but the habitats vary considerably, and no connecting suitable habitat exists	This species is marine and only found on beaches near marine environments	It would be extremely difficult for this species to disperse to any habitat within the study area
Ctenotus angusticeps Airlie Island Ctenotus	P3 (DBCA list)	2012	2.7 km NNW	grassland	The Airlie Island Ctenotus is known from approximately 12 locations in north-west WA {Department of the Environment and Energy, 2018 #18966}. On the mainland it generally inhabits the landward fringe of salt marsh communities in samphire shrubland or marine couch grassland {Maryan, 2013, #19073} in the intertidal zone along mangrove (Grey Mangrove (Avicennia marina) with occasional Red Mangrove (*Rhizophora stylosa*)) margins, however, subtle differences in vegetation/topography exist among sites where the species has been recorded {Biologic, 2012, #19074}. The Airlie Island Ctenotus is strongly associated with samphire species	Unlikely	The record is not considered recent	There are records close to the study area	Limited corridors are available to facilitate dispersal into the study area, although it is unlikely, they would occur in significant proportions for important life history stages	The project is unlikely to significantly impact populations nearby and this species may only be detected in low abundance (if detected at all)

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
					Tectornia halocnemoides subsp.tenuis and *Suaeda arbusculoides*, which occur on clayey soils, and mixed herb and grass cover of Muellerolimon salicorniaceum and Sporobolus virginicus, which occur on sandy soils {Maryan, 2013, #19073}					
Eretmochelys imbricata Hawksbill Turtle	VU/Mig./VU (EPBC Act; BC Act)	Historical written record	7.9 km NNE	Marine	Marine environments	Unlikely	Historic records may not represent current species distribution	The location is close, but the habitats vary considerably, and no connecting suitable habitat exists	This species is marine and only found on beaches near marine environments	it would be extremely difficult for this species to disperse to any habitat within the study area
Liasis olivaceus barroni Pilbara Olive Python	VU (EPBC & BC Acts)	2012	26.4 km SSE	Rocky areas near water	It is commonly found in rocky areas in association with watercourses and pools and often associated with areas of permanent pooling water near rocky habitats, such as gullies, gorges and rocky ranges or boulder sites.	Unlikely	The record is not considered recent	Records are relatively close to the study area and this species has a high potential dispersal rate	Limited suitable habitat is available within the study area, although it is considered possible that this species may infrequent the study area and make use of the available habitats	Given the lack of recent records and the wide available habitats outside the study area, it is unlikely that the study area supports a significant number of this species or provides important

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
										resources for significant life history stages
Natator depressus Flatback Turtle	VU/Mig./VU (EPBC Act; BC Act)	Historical written record	1.7 km W	Marine	Marine environments	Unlikely	Historic records may not represent current species distribution	The location is close, but the habitats vary considerably, and no connecting suitable habitat exists	This species is marine and only found on beaches near marine environments	it would be extremely difficult for this species to disperse to any habitat within the study area
Non-migratory Birds (5)										
Falco hypoleucos Grey Falcon	VU (BC Act)	2017	6.7 km SW	Cosmopolitan	It uses a large variety of habitats such as timbered plains, creeklines, shrublands and open grasslands.	**Recorded**				
Falco peregrinus Peregrine Falcon	OS (BC Act)	2012	1.4 km NNW	Rocky areas near water	The Peregrine Falcon's preferred habitat includes cliffs and wooded watercourses. Nesting occurs mainly on cliff ledges, granite outcrops, quarries and in trees with old raven or Wedge-tailed Eagle nests.	Unlikely	The record is not considered recent	Records are located relatively close to the study area and this species has a high potential dispersal rate	Limited suitable habitat is available within the study area, although it is considered possible that this species may infrequent the study area and make use of the available habitats	Given the lack of recent records and the wide available habitats outside the study area, it is unlikely that the study area supports a significant number of this species or provides important resources for

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
										significant life history stages
Pezoporus occidentalis Night Parrot	EN/CR (EPBC Act; BC Act)	N/A	Projected distribution	Spinifex	Appears to favour areas of dense vegetation comprising old-growth (often > 50 years unburnt) Spinifex (Triodia spp.) especially hummocks that are ring-forming for roosting and nesting. Such areas may also be associated with dense chenopod shrubs. It is thought that Spinifex hummocks that are <40-50 cm in height are not likely to provide adequate shelter for roosting and nesting.	Unlikely	The record date is not available, but not likely to be recent, given the lake of information available	Projected distribution is not as accurate as locational data but possible could occur in the study area	Some suitable habitat may be located within the study area. However; the study area is surrounded by disturbances (current operations, urbanisation, roads etc.)	Due to a lack of record specificity and the potential of feral pests and disturbance to this area, it is unlikely that a significant proportion or significant life history stages for this species is supported within the study area.
Rostratula australis Australian Painted Snipe	EN (EPBC & BC Acts)	N/A	Projected distribution	Wetland	Inhabits shallow terrestrial fresh-brackish wetlands, including temporary and permanent lakes, swamps and claypans, waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains.	Unlikely	The record date is not available, but not likely to be recent, given the lake of information available	Projected distribution is not as accurate as locational data but possible to occur in the study area	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
Sterna nereis nereis Fairy Tern	VU (EPBC & BC Acts)	2008	6.7 km N of study area	Wetland	They nest on sheltered, sandy beaches. They have also been known to occur on the edges of offshore, estuaries, islands, wetlands and other areas of the mainland coastline {DCCEEW, 2023 #15064}	Unlikely	The record is not considered recent.	Records are within 10 km of the study area and this species is capable of wide dispersal	The study area is in proximity to suitable habitat although there is no suitable habitat within the study area	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Migratory Birds (52)										
Apus pacificus Fork-tailed Swift	Mig. (EPBC & BC Acts)	2012	8.8 km NE	Open grasslands	Occurs in a wide range of dry or open habitats, including riparian woodlands, tea-tree swamps, low scrub, heathland, Saltmarsh, grassland and spinifex sandplains, open farmland and inland and coastal sand-dunes {DSEWPaC, 2011 #1749}.	**Recorded**				
Pandion cristatus Osprey	Mig. (EPBC & BC Acts)	2016	975 m N	Coastal	*P. cristatus* is present across most of coastal Australia but is absent from Tasmania and Victoria. In south coastal	**Recorded**				

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
					Western Australia, the species extends as far east as Esperance {Johnstone, 1998 #433; Poole, 2002 #13077}.					
Xenus cinereus Terek Sandpiper	Mig. (EPBC & BC Acts)	2015	3.4 km WSW	Wetland	Found primarily in coastal areas and inland wetlands of the Pilbara and Kimberley regions {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are within 10 km of the study area and species is capable of wide dispersal	The study area is in proximity to suitable habitat although there is no suitable habitat within the study area	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Tringa stagnatilis Marsh Sandpiper	Mig. (EPBC & BC Acts)	2015	6.4 km NNE	Wetland	The Marsh Sandpiper occurs along the Western Australian coast and throughout parts of eastern Australia. It inhabits coastal and inland wetlands, estuarine and mangrove mudflats, beaches, swamps, lakes and several other types of wetlands {Morcombe, 2004 #558}.	Unlikely	The record is relatively recent.	Records are within 10 km of the study area and species is capable of wide dispersal	The study area is in proximity to suitable habitat although there is no suitable habitat within the study area	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
										habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Tringa nebularia Common Greenshank	Mig. (EPBC & BC Acts)	2015	1.9 km ENE	Wetland	They prefer coastal open mudflats.	Unlikely	The record is relatively recent.	Records are within 10 km of the study area and species is capable of wide dispersal	The study area is in proximity to suitable habitat although there is no suitable habitat within the study area	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Tringa glareola Wood Sandpiper	Mig. (EPBC & BC Acts)	2014	1.9 km ENE	Wetland	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes {Department of the	Unlikely	The record is relatively recent.	Records are within 10 km of the study area and species is	The study area is in proximity to suitable habitat although there	Suitable habitat is not available within the study area.

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
					Environment and Energy, 2018 #18966}.			capable of wide dispersal	is no suitable habitat within the study area	Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Tringa brevipes Grey-tailed Tattler	Mig. EPBC and BC Acts; P4 DBCA list	2015	606 m ESE	Wetland	Prefers sheltered coasts and intertidal mudflats. They have also been known to utilise reefs, rock platforms and intertidal areas that are exposed intertidal areas. They are commonly found in various waterbodies including mudflats, estuaries, lagoons and mangrove areas {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Record are within 10 km of the study area and species is capable of wide dispersal	The study area is in proximity to suitable habitat although there is no suitable habitat within the study area	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages

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Thalasseus bergii Crested Tern	Mig. (BC Act)	2015	3.3 km ENE	Wetland	Occurs in temperate and tropical environments in South Africa and Australia. They are found in coastal areas including low-lying rocky, sandy and coral islands. Many of the areas they occur have a distinct lack of shelter. They are often found on open shores and less often found in tidal creeks and inland waterbodies {ALA, 2023 #15047}	Unlikely	The record is relatively recent.	Record are within 10 km of the study area and species is capable of wide dispersal	The study area is in proximity to suitable habitat although there is no suitable habitat within the study area	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Sula leucogaster Brown Booby	Mig. (EPBC & BC Acts)	1979	13.3 km NNE	Wetland	In Western Australia, the Brown Booby is found from Bedout Island and near Onslow, and north to Bunker Group of islands in Queensland Off north-west Western Australia, Brown Boobies are most abundant 18–36 km from land, but also occur inside and outside these limits {Department of the Environment and Energy, 2018 #18966}. It uses both marine and terrestrial habitats but tends to stay close to breeding	Unlikely	The record is not considered recent.	Records are within 10 to 50 km of the study area and species is capable of wide dispersal	The study area is in proximity to suitable habitat although there is no suitable habitat within the study area	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
					sites, such as tropical islands, continental islands, sand cays and atolls for breeding. It is known to approach mainland coastlines more than other boobies and has been recorded in coastal waters, harbours and estuaries and near offshore islands but seldom flying over land {Department of the Environment and Energy, 2018 #18966}.					numbers or undertake important life history stages
Sternula albifrons Little Tern	Mig. (EPBC & BC Acts)	2015	6.4 km N	Wetland	Occur in coastal areas and waterbodies including harbours, inlets, lagoons, estuaries and bays, particularly those with sandbanks and exposure to ocean beaches {DCCEEW, 2023 #15064}	Unlikely	The record is considered recent.	Records are within 10 km of the study area and species is capable of wide dispersal	The study area is in proximity to suitable habitat although there is no suitable habitat within the study area	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
Sterna hirundo Common Tern	Mig. (EPBC & BC Acts)	2015	6.4 km NNE	Wetland	They occur in marine, coastal and pelagic environments and are usually observed in coastal waters in beaches, platforms and sheltered areas including harbours and estuaries {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are within 10 km of the study area and species is capable of wide dispersal	The study area is in proximity to suitable habitat although there is no suitable habitat within the study area	Suitable habitat is not available within the study area. Individuals can move through the study area in search of other suitable habitats. This species is unlikely to occur in significant numbers or undertake important life history stages
Pluvialis squatarola Grey Plover	Mig. (EPBC & BC Acts)	2015	3.3 km ENE	Wetland	Inhabits coastal areas, typically those sheltered such as embayments and estuaries, although they are also known to occupy rocky coasts and platforms. Occasionally they are found in inland waterbodies {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
Pluvialis fulva Pacific Golden Plover	Mig. (EPBC & BC Acts)	2015	7.3 km NE	Wetland	Typically inhabits coastal environments and occasionally can be found in wetlands, mudflats and sandflats in sheltered areas. They have been found on islands, sand and coral cays. They have been recorded in terrestrial environments, usually near waterbodies and paddocks areas {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Plegadis falcinellus Glossy Ibis	Mig. (EPBC & BC Acts)	2013	1.9 km ENE of study area	Wetland	Inland, freshwater wetlands are preferred, in particular, permanent or ephemeral waterbodies on floodplains and shallow swamps with abundant aquatic flora.	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Philomachus pugnax Ruff	Mig. (EPBC & BC Acts)	1979	3.4 km WSW of study area	Wetland	Typically occupies saline and brackish wetlands with mudflats. They have been found in a range of wetlands including lakes, swamps, tidal	Unlikely	The record is not considered recent.	Records are relatively close to the study area and this species has a	Suitable habitat is not available within the study area,	It is unlikely the project would provide suitable habitat in

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
					rivers, and floodlands. There are some records of them occupying sheltered coastal areas such as harbours and estuaries and wetlands surrounded by dense vegetation {DCCEEW, 2023 #15064}			high potential dispersal rate	potential suitable habitat is located nearby	significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Phalaropus lobatus Red-necked Phalarope	Mar/Mig. (EPBC Act; BC Act)	1981	34.2 km E	Wetland	Records indicate their preference for occurring at sea during non-breeding periods. They have been recorded in inland coastal areas, highly saline water bodies including lakes, swamps and wetlands in Australia {DCCEEW, 2023 #15064}	Unlikely	The record is not considered recent.	The record is relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Onychoprion anaethetus Bridled Tern	Mig. (EPBC & BC Acts)	1995	6.8 km NW	Coastal/ Wetland	They occupy subtropical and tropical sea environments including islands, coral cays with adequate vegetation, and continental islands but are rarely recorded on inshore continental waters, although they have been reported breeding on mainland Western	Unlikely	The record is not considered recent	The record is relatively close to the study area and this species has a high potential for dispersal	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	Given the age of this record as well as the species' habitat preferences, it is unlikely that this species will be occupying

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
					Australia {DCCEEW, 2023 #15064}					habitats within the study area and even less likely to be found within the study area in significant abundance
Oceanites oceanicus Wilson's Storm Petrel	Mig. (EPBC & BC Acts)	2015	7.9 km NNE	Wetland	This species spends most of its life at sea, although during the non-breeding season, they can occur in tropical and subtropical waters {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Numenius phaeopus Whimbrel	Mig. (EPBC & BC Acts)	2017	606 m ESE	Wetland	Usually found on intertidal mudflats and sheltered coastal areas. They have also been found in other waterbodies including harbours, lagoons, estuaries, rivers and mangroves. Occasionally they are found in sandy and rocky beaches or intertidal areas {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
										therefore the outcome is unlikely.
Numenius minutus Little Curlew	Mig. (EPBC & BC Acts)	2016	1.9 km ENE of study area	Wetland	They spend the non-breeding season in northern Australia from Port Hedland to the Queensland coast {Department of the Environment and Energy, 2018 #18966}. The Little Curlew is most often found feeding in grassland and sedgeland with scattered, shallow freshwater pools or areas seasonally inundated. It will also use open woodlands with a grassy or burnt understorey, dry saltmarshes, coastal swamps, mudflats or sandflats of estuaries or beaches on sheltered coasts. Mown lawns, gardens, recreational areas, ovals, racecourses and verges of roads and airstrips are also used {Higgins, 1996, 18967}.	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Numenius madagascariensi Eastern Curlew	CR/Mig. /CR (EPBC Act; BC Act)	2022	3.3 km ENE	Wetland	Australia's largest and elusive shorebird. Little information is available on this species given this species' shyness and records taking flight at the first sign of disturbance {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable	It is unlikely the project would provide suitable habitat in significant proportions for a

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
									habitat is located nearby	significant number of individuals and therefore the outcome is unlikely.
Motacilla flava Yellow Wagtail	Mig. (EPBC & BC Acts)	1982	7.3 km NE	Cosmopolitan	Uses a large variety of habitats.	Unlikely	The record is not considered recent	Records are located relatively close to the study area and this species has a high potential dispersal rate	Potential suitable habitat may be available within the study area.	Given the lack of recent records and the wide available habitats outside the study area, it is unlikely that the study area supports a significant number of this species or provides important resources for significant life history stages
Motacilla cinerea Grey Wagtail	Mig. (EPBC & BC Acts)	N/A	Projected distribution	Cosmopolitan	Uses a large array of habitats. A small wagtail that is a vagrant visitor to Australia that inhabits fast-flowing streams and rivers {IUCN, 2019 #13085}.	Unlikely	The record date is not available, but likely to be recent	Projected distribution is not as accurate as locational data but possible could occur in the study area	Suitable habitat is likely present within the study area	Given the lack of recent records and the wide available habitats outside the study area, it is

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
										unlikely that the study area supports a significant number of this species or provides important resources for significant life history stages
Macronectes giganteus Southern Giant Petrel	EN/Mig. /Mig. (EPBC Act; BC Act)	N/A	Projected distribution	Wetland	Pelagic. Breeds on six subantarctic and Antarctic islands in Australian territory {Department of the Environment and Energy, 2018 #18966}.	Unlikely	The record date is not available, but likely to be recent	Projected distribution is not as accurate as locational data but possible to extend to the study area	No suitable habitats available within the study area	It is very unlikely this species will occupy te study area and if found inside or nearby, will likely be passing through and not reliant on the habitat available within the study area in significant proportions or during important life history stages

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
Limosa limosa Black-tailed Godwit	Mig. (BC Act)	2012	1.9 km ENE	Wetland	Typically found in coastal environments with sheltered bays, estuaries and lagoons. Habitat use is dictated by the tides. They are also found in shallow and sparsely vegetated near-coastal wetlands {DCCEEW, 2023 #15064}	Unlikely	The record is not considered recent	Records are located relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Limosa lapponica Bar-tailed Godwit	Mig. (EPBC & BC Acts)	2015	3.3 km ENE	Wetland	Occupies a variety of aquatic habitats such as intertidal sandflats, banks, mudflats, estuaries coastal lagoons and harbours. They have also been found in saltmarshes and brackish coastal wetlands {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Limnodromus semipalmatus Asian Dowitcher	Mig. (EPBC & BC Acts)	2015	7.3 km NE of study area	Wetland	Inhabits sheltered coastal habitats including tidal creeks, coastal lagoons and estuaries. There are many records utilising mudflats and sandflats.	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a	Suitable habitat is not available within the study area,	It is unlikely the project would provide suitable habitat in

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
					They are also known to occupy ponds, saltworks and sewage farms {DCCEEW, 2023 #15064}			high potential dispersal rate	potential suitable habitat is located nearby	significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Limicola falcinellus Broad-billed Sandpiper	Mig. (BC Act)	2015	7.3 km NE	Wetland	Found in sheltered coastal environments, mudflats and favours estuarine habitats. Occasionally they have been found occupying saltmarshes, freshwater lagoons, saltworks and sewage farms. They have also been known to occupy creeks, swamps and lakes near the coast, favouring those with mudflats and exposed sands with receding tides {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Hydroprogne caspia Caspian Tern	Mig. (EPBC & BC Acts)	2015	2.3 km ENE	Wetland	Found in sheltered coastal habitats and near-coastal terrestrial wetlands {DAWE, 2022 #13929}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
										individuals and therefore the outcome is unlikely.
Hirundo rustica Barn Swallow	Mig. (EPBC & BC Acts)	2015	2.2 km ENE	Coastal	Inhabits open country in coastal lowlands and, in or over freshwater wetlands, woodland, shrublands and tussock grassland.	**Possible**	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Abundant suitable habitats available within the study area	Given the recent record, ability to disperse and abundance of habitat it is possible that this species may rely on resources within the study area and was not detected during the survey
Glareola maldivarum Oriental Pratincole	Mig. (EPBC & BC Acts)	2015	1.1 km E	Wetland	Inhabits open plains, floodplains or short grassland, wetlands, saltworks and sewage farms. May also occur along the coast, inhabiting beaches, mudflats and islands, or around coastal lagoons.	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
										outcome is unlikely.
Gelochelidon nilotica Gull-billed Tern	Mig. (BC Act)	2012	1.1 km E	Wetland	Gull-billed Terns are found in freshwater swamps, brackish and salt lakes, beaches and estuarine mudflats, floodwaters, sewage farms, irrigated croplands and grasslands. They are only rarely found over the ocean.	Unlikely	The record is not considered recent	Records are located relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Gallinago stenura Pin-tailed Snipe	Mig. (EPBC & BC Acts)	2014	4.7 km E	Wetland	Usually found on the edges of swamps, ponds and lakes with vegetation available. They have also been found in open claypans and arid parts of the overall species range. They have been recorded in sewage ponds and less often in intertidal wetlands {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Fregata minor Greater Frigatebird	Mig. (EPBC & BC Acts)	N/A	Projected distribution	Marine	This species has a wide distribution, moving between countries along the equator	Unlikely	The date is not available for this record,	Distribution is not based on location	No habitat information regarding	Coastal environments are marginally

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
					during the non-breeding season, including the northern parts of Australia {BirdLife International, 2023 #15547}		therefore it is unlikely to be very recent	evidence and is inferred. Therefore less likely to represent the entire population although, possible.	terrestrial environments. Meaning it is either not well understood and unlikely to favour those habitats	available within the study area but prone to disturbance. While technically possible due to dispersal potential, habitat preferences and lack of evidence mean it is unlikely for this species to occupy the study area in significant numbers or for significant life history stages
Fregata ariel Lesser Frigatebird	Mig. (EPBC & BC Acts)	2016	6.4 km NNE	Wetland	It is usually seen in tropical or warmer waters off northern Western Australia, Northern Territory, Queensland and northern New South Wales. The species is usually pelagic and often found far from land but is also found over shelf waters, in inshore areas, and inland over continental	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
					coastlines {Marchant, 1990 #346}.					outcome is unlikely.
Chlidonias leucopterus White-winged Black Tern	Mig. (EPBC & BC Acts)	2015	2.2 km NE	Wetland	Typically occurs in wetland environments such as brackish, saline and coastal areas. They are also known to occupy sheltered areas such as estuaries. harbours and lagoons particularly those with sandflats and mudflats {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Charadrius veredus Oriental Plover	Mig. (EPBC & BC Acts)	2016	6.7 km N	Wetland	Oriental Plovers spend a few weeks in coastal habitats such as estuarine mudflats and sandbanks, on sandy or rocky ocean beaches or nearby reefs, or in near-coastal grasslands, before dispersing further inland, where they are found in sparsely vegetated plains or recently burnt open areas.	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Charadrius mongolus Lesser Sand Plover	EN/Mig. (EPBC & BC Acts)	2015	3.4 km WSW	Wetland	Typically found in coastal and estuarine environments. They are known to utilise intertidal	Unlikely	The record is relatively recent.	Records are relatively close to the study	Suitable habitat is not available	It is unlikely the project would provide

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
					mudflats and sandflats, as well as sheltered harbours. They are known to occasionally occupy sandy beaches and rock platforms. There are records of this species utilising saltmarshes, mangrove saltworks, brackish swamps and silt islands {DCCEEW, 2023 #15064}			area and this species has a high potential dispersal rate	within the study area, potential suitable habitat is located nearby	suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Charadrius leschenaultii Greater Sand Plover	VU/Mig./VU (EPBC Act; BC Act)	2015	3.4 km WSW	Wetland	Utilises coastal and estuarine environments. They typically occupy sheltered sandy or muddy beaches as well as intertidal sandbanks and mudflats, reefs and rock platforms. They have occasional records occupying saltworks, saltlakes and marginal saltmarshes and brackish swamps {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Calonectris leucomelas Streaked Shearwater	Mig. (EPBC & BC Acts)	N/A	Projected distribution	Marine	It occurs frequently in northern Australia, with records from central Western Australia, around the north coast, and south to central New South Wales {Marchant, 1990 #346}. The species occurs over pelagic and inshore waters. In northern	Unlikely	The date not available for this record is unlikely to be very recent	Distribution is not based on location evidence and is inferred. Therefore less likely to represent the	No habitat information regarding terrestrial environments. Meaning it is either not well understood	Coastal environments are marginally available within the study area but prone to disturbance.

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
					Australia, the streaked shearwater is usually found in offshore waters more than 18 kilometres from the mainland coast {Marchant, 1990 #346}.			entire population although, possible.	and unlikely to favour those habitats	While technically possible due to dispersal potential, habitat preferences and lack of evidence mean it is unlikely for this species to occupy the study area in significant numbers or for significant life history stages
Calidris tenuirostris Great Knot	CR/Mig. /CR (EPBC Act; BC Act)	2015	3.4 km WSW	Wetland	They usually occupy sheltered coastal habitats as well as mudflats and sandflats such as inlets, bays, harbours, estuaries and lagoons. They have been known to occupy reefs and rock platforms as well as shorelines and mangroves. There are also records in swamps near the coast, saltlakes and non-tidal lagoons {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
Calidris subminuta Long-toed Stint	Mig. (EPBC & BC Acts)	2015	1.9 km ENE	Wetland	They occupy a variety of wetlands. They appear to favour shallow, freshwater and brackish wetlands including river floodplains, sewage ponds, swamps and lagoons. They are also known to occur on muddy shorelines, weeds and sedges and occasionally stunted samphire. They are known to occupy permanent wetlands and artificial lakes {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Calidris ruficollis Red-necked Stint	Mig. (EPBC & BC Acts)	2015	1.9 km ENE	Wetland	They are found across a wide range of open mudflat-like habitats in salt as well as freshwater systems.	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Calidris melanotos Pectoral Sandpiper	Mig. (EPBC & BC Acts)	2014	8.9 km E	Wetland	Shallow fresh to saline wetlands such as coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a	Suitable habitat is not available within the study area,	It is unlikely the project would provide suitable habitat in

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
					pools, creeks, floodplains and artificial wetlands.			high potential dispersal rate	potential suitable habitat is located nearby	significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Calidris ferruginea Curlew Sandpiper	CR/Mig./CR (EPBC Act; BC Act)	2015	2.3 km ENE	Wetland	Occurs on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand.	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Calidris canutus Red Knot	EN/Mig./EN (EPBC Act; BC Act)	2015	1.9 km ENE	Wetland	Typically occupying intertidal mudflats, sandflats and sheltered coasts. They are also known to occupy beaches, lagoons, harbours and sandy beaches. They have also been recorded occupying saline terrestrial wetlands and sewage ponds and are rarely	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
					found in freshwater swamps {DCCEEW, 2023 #15064}					individuals and therefore the outcome is unlikely.
Calidris alba Sanderling	Mig. (EPBC & BC Acts)	2014	3.4 km WSW	Wetland	Found utilising coastal environments open to sea swell as well as sandbars and spits and shingle banks. They also occur on wave-washed rock outcrops. They are also less frequently found in estuaries and inlet harbours and near coastal inland wetlands {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Calidris acuminata Sharp-tailed Sandpiper	Mig. (EPBC & BC Acts)	2015	1.9 km ENE	Wetland	Muddy edges of shallow fresh or brackish vegetated wetlands, including lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland {Department of the Environment and Energy, 2018 #18966}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
Arenaria interpres Ruddy Turnstone	Mig. (EPBC & BC Acts)	2015	2.3 km ENE	Wetland	Usually found in coastal regions containing exposed rocks. They are also found in tidal pools and beaches. They are also known to be found on sandy beaches, clay ridges and occasionally in estuaries, harbours and lagoons. They have been recorded on sewage ponds and mudflats {DCCEEW, 2023 #15064}	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Anous stolidus Common Noddy	Mig. (EPBC & BC Acts)	N/A	Projected distribution	Coastal Areas	Occurs mainly in the ocean off the Queensland coast, but also off the north-west and central Western Australia coast {Department of the Environment and Energy, 2018 #18966}. During the breeding season, it occurs on or near islands, on rocky islets and stacks with precipitous cliffs, or shoals or cays of coral or sand {Department of the Environment and Energy, 2018 #18966}. During the non-breeding period, the species occurs in groups in the open ocean {Higgins, 1996, 18967}.	Unlikely	The date is not available for this record therefore it is unlikely to be a very recent	Distribution is not based on location evidence and is inferred. Therefore, less likely to represent the entire population although, possible.	The study area has limited available habitat to support this species' habitat preferences	Given the lack of recent records and the wide available habitats outside the study area, it is unlikely that the study area supports a significant number of this species or provides important resources for significant life history stages

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
Actitis hypoleucos Common Sandpiper	Mig. (EPBC & BC Acts)	2017	1.9 km ENE	Wetland	Small ponds, large inlets, and mudflats where they forage on the shore usually close to the vegetation.	Unlikely	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	Suitable habitat is not available within the study area, potential suitable habitat is located nearby	It is unlikely the project would provide suitable habitat in significant proportions for a significant number of individuals and therefore the outcome is unlikely.
Mammals (11)										
Macrotis lagotis Greater Bilby	VU (EPBC & BC Acts)	2019	Within study area	Grassland	Prefers hummock grassland in plains and alluvial areas, open tussock grassland on uplands and hills, and mulga woodland/shrubland on ridges and rises.	**Recorded**				
Dasycercus blythi Brush-tailed Mulgara	P4 (DBCA list)	2019	Within study area	Spinifex	Occurs in spinifex grasslands throughout much of the arid zone, digging their burrows in the flats between low dunes.	**Recorded**				
Pseudomys chapmani Western Pebble-mound Mouse	P4 (DBCA list)	2015	27.7 km E	Spinifex	The mounds are located on the gentle slopes of rocky ranges covered in rocky mulch, hard spinifex and sparse trees and shrubs (Eucalyptus, Senna, Acacia and Ptilotus). They are	**Possible**	The record is relatively recent.	Records are relatively close to the study area and this species has the potential to	Possible habitat within the study area (depending on vegetation types present. Although may	Given the potential suitable habitat, proximity, and date of the record, the study area

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
					also often found near Acacia-dominated drainage lines.			disperse into the study area	not be as rocky as required.	may support a proportion of this population.
Dasyurus hallucatus Northern Quoll	EN (EPBC & BC Acts)	2018	4.0 km WNW	Rocky, Grassland, drainage	Found in a variety of habitats; however, rocky areas provide important denning habitat, while they forage in nearby grasslands and creeklines.	**Possible**	The record is relatively recent.	Records are relatively close to the study area and this species has a high potential for dispersal	Suitable habitat is available within the study area which means it could be possible for this species to persist within the study area	Given the recent records, proximity and dispersal potential, it is possible this species may occur within the study area and was simply not detected during the survey
Sousa sahulensis Australian humpback dolphin	P4 (DBCA list)	Historical written record	7.9 km NNE	Marine	Marine environments	Unlikely	Historic records may not represent current species distribution	The location is close, but the habitats vary considerably, and no connecting suitable habitat exists	This species is exclusively marine and very rarely inhabits waters of relatively low depth	It is extremely difficult for this species to disperse to any habitat within the study area
Rhinonicteris aurantia Pilbara Leaf-nosed Bat	VU (EPBC & BC Acts)	2018	27.4 km E	Caves	Roosts in caves and mines with stable, warm and humid microclimates in the Hamersley and Chichester Ranges.	Unlikely	The record is considered recent.	Records are relatively close to the study area and this species has a high potential dispersal rate	While possible for this species to be detected within the study area. No roosting habitat is	Given the distance to travel and forage within the study area, it is unlikely that the study

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
									available within the study area. Some areas may be potential foraging habitats, however, the distance to what is likely roosting locations on the map is approximately 70 km away.	area provides significant resources to this species.
Mormopterus cobourgianus North-western Free-tailed Bat	P1 (DBCA list)	2009	3.1 km NNE	Caves	This species has a restricted range and appears to favour mangroves and adjoining areas in small spouts, crevices and dead branches of mangroves. This species is relatively data deficient {Australian Museum, 2020 #15546}.	Unlikely	The record is not considered recent	Records are located relatively close to the study area and this species has a high potential dispersal rate	Possibly suitable foraging habitat available within the study area. No available caves or disused mines for roosting and breeding habitats	Unlikely for this species to occupy the study area for important life history stages. Possible for them to infrequently use the habitat for foraging, although abundant foraging habitat is available outside the study area.

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
										Therefore it is unlikely the study area supports this population significantly.
Macroderma gigas Ghost Bat	VU (EPBC & BC Acts)	2017	25.0 km SSE	Caves	Prefers to roost in caves beneath bluffs of low, rounded hills composed of Marra Mamba geology, granite rock piles in the Pilbara and sandstone elsewhere, as well as addits (abandoned mines).	Unlikely	The record is relatively recent	Records are located relatively close to the study area and this species has a high potential dispersal rate	Possibly suitable foraging habitat available within the study area. No available caves or disused mines for roosting and breeding habitats	Unlikely for this species to occupy the study area for important life history stages. Possible for them to infrequently use the habitat for foraging, although abundant foraging habitat is available outside the study area. Therefore it is unlikely the study area supports this population significantly.
Lagostrophus fasciatus fasciatus	VU (EPBC & BC Acts)	Historical written record	8.1 km E	Cosmopolitan	This species utilises a variety of habitats such as grasslands, heathlands and dunes. They	Unlikely	Historic records may not represent	Records are relatively close to the study	Suitable habitat is available	Given the lack of recent records and

Species	Status	Most recent record	Proximity to study area	Broad habitat label	Habitats (Breeding, foraging and dispersal)	Likelihood	Rational one	Rationale 2	Rationale 3	Rationale 4
Banded Hare-wallaby, Mernine					typically occur in dense vegetation and utilises shrubs for shelter. Runways are produced beneath shrubs to allow efficient movement. These runways in dense vegetation are important for predator evasion {DCCEEW, 2023 #15064}		current species distribution	area and this species has a high potential for dispersal	within the study area which means it could be possible for this species to persist within the study area	the wide available habitats outside the study area, it is unlikely that the study area supports a significant number of this species or provides important resources for significant life history stages
Dugong dugon Dugong	OS (BC Act)	Historical written record	7.9 km NNE	Marine	Marine environments	Unlikely	Historic records may not represent current species distribution	The location is close, but the habitats vary considerably, and no connecting suitable habitat exists	This species is exclusively marine and very rarely inhabits waters of relatively low depth	This species cannot disperse to any habitat within the study area

Rows coloured grey indicated species recorded during survey

Appendix 6 Fauna species by site matrix

Family	Species	Common	BIE001	BIE002	BIE003	BIE004	BIE005	BIE006	BIE007	BIE008	BIE009	BIE010	BP004	BT001-007	BP001-025	Opp001-016
Amphibians (2)																
Hylidae	*Litoria rubella*	Little Red Tree Frog					1	1								
Limnodynastidae	*Notaden nichollsi*	Desert Spadefoot		1	4											
Birds (48)																
Accipitridae	*Aquila audax*	Wedge-tailed Eagle			1											
	Circus assimilis	Spotted Harrier		1	1					1						
	Elanus caeruleus	Black-shouldered Kite														1
	Haliastur indus	Brahminy Kite						1	1							1
	Haliastur sphenurus	Whistling Kite			1											
	Pandion cristatus	Osprey														1
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar														1
Alaudidae	*Mirafra javanica*	Horsfield's Bushlark			1	2										5
Apodidae	*Apus pacificus*	Fork-tailed Swift				2										
Artamidae	*Artamus cinereus*	Black-faced Woodswallow	1			2		20								
	Artamus personatus	Masked Woodswallow	51			45	6									5
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	2	1		1	5	9		1						1
	Lalage tricolor	White-winged Triller					1	10								
Caprimulgidae	*Eurostopodus argus*	Spotted Nightjar					3									1
Columbidae	*Geopelia cuneata*	Diamond Dove						5								
	Geopelia striata	Zebra Dove						3								
	Ocyphaps lophotes	Crested Pigeon	16					2								
	Phaps histrionica	Flock Bronzewing														1

Family	Species	Common	BIE001	BIE002	BIE003	BIE004	BIE005	BIE006	BIE007	BIE008	BIE009	BIE010	BP004	BT001-007	BP001-025	Opp001-016
Corvidae	*Corvus orru*	Torresian Crow		1	2	1		3	2							
Cuculidae	*Heteroscenes pallidus*	Pallid Cuckoo						1								
	Chalcites basalis	Horsfield's Bronze Cuckoo			1											
Dicruridae	*Grallina cyanoleuca*	Magpie-lark					1	5								
	Rhipidura albiscapa	Grey Fantail						1		1						
	Rhipidura leucophrys	Willie Wagtail	1		1		1	1								
Estrilidae	*Taeniopygia castanotis*	Zebra Finch	1	3	4	10	1	75		35						5
Falconidae	*Falco berigora*	Brown Falcon	1		1				1							
	Falco cenchroides	Australian Kestrel	1		1	2		1	1							
	Falco hypoleucos	Grey Falcon	2													3
	Falco subniger	Black Falcon			1											
Halcyonidae	*Dacelo leachii*	Blue-winged Kookaburra					1									
	Todiramphus pyrrhopygius	Red-backed Kingfisher			1		3	5								1
Hirundinidae	*Hirundo neoxena*	Welcome Swallow							1							
	Petrochelidon nigricans	Tree Martin	3		10			21		5						
Maluridae	*Malurus assimilis*	Purple-backed Fairy-wren	1													4
	Malurus leucopterus	White-winged Fairy-wren		1	7	1			3							
Meliphagidae	*Gavicalis virescens*	Singing Honeyeater	5	1	4	2	1	3		1						
	Manorina flavigula	Yellow-throated Miner						11								
	Ptilotula penicillata	White-plumed Honeyeater					1	8								
Meropidae	*Merops ornatus*	Rainbow Bee-eater			2	3	2	9								1
Motacillidae	*Anthus australis*	Australian Pipit		1	1											
Otididae	*Ardeotis australis*	Australian Bustard			1											

Family	Species	Common	BIE001	BIE002	BIE003	BIE004	BIE005	BIE006	BIE007	BIE008	BIE009	BIE010	BP004	BT001-007	BP001-025	Opp001-016
Pardalotidae	*Pardalotus rubricatus*	Red-browed Pardalote						7								
Psittacidae	*Cacatua sanguinea*	Little Corella	1													
	Melopsittacus undulatus	Budgerigar	30	57	1	45	1	37		18						16
	Nymphicus hollandicus	Cockatiel	41			1	29									
Sylviidae	*Megalurus cruralis*	Brown Songlark			3	2		1								7
Turnicidae	*Turnix velox*	Little Button-quail	2	1	4	2			1	1						
Tytonidae	*Tyto alba*	Barn Owl						2								
Mammals (15)																
Canidae	*Vulpes vulpes*	Red Fox						✓								
Dasyuridae	*Dasycercus blythi*	Brush-tailed Mulgara									✓	✓				✓
	Dasykaluta rosamondae	Little Red Kaluta	9	6	1											
	Sminthopsis youngsoni	Lesser Hairy-footed Dunnart	1			2	1									
Felidae	*Felis catus*	Cat		✓			✓	✓								✓
Macropodidae	*Osphranter rufus*	Red Kangaroo	✓	✓	✓	✓	✓	✓		✓						
Molossidae	*Chaerephon jobensis*	Greater Northern Freetail-bat	✓	✓			✓	✓								
Muridae	*Notomys alexis*	Spinifex Hopping-mouse				✓		✓								✓
	Pseudomys hermannsburgensis	Sandy Inland Mouse			2											
Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked Echidna														✓
Thylacomyidae	*Macrotis lagotis*	Greater Bilby	✓	✓									✓	✓	✓	
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat	✓	✓			✓	✓								
	Nyctophilus geoffroyi	Lesser Long-eared Bat	✓													
	Scotorepens greyii	Little Broad-nosed Bat	✓	✓			✓	✓								
	Vespadelus finlaysoni	Finlayson's Cave Bat	✓	✓			✓	✓								

Family	Species	Common	BIE001	BIE002	BIE003	BIE004	BIE005	BIE006	BIE007	BIE008	BIE009	BIE010	BP004	BT001-007	BP001-025	Opp001-016
Reptiles (38)																
Agamidae	*Ctenophorus isolepis*	Central Military Dragon	2	2	8	11	1	20		23						
	Ctenophorus nuchalis	Central Netted Dragon					1									
	Gowidon longirostris	Long-nosed Dragon	2			1	12	18		2						1
Diplodactylidae	*Nephrurus levis*	Smooth Knob-tailed Gecko		4	3	1										
	Diplodactylus bilybara	Western Fat-tailed Gecko	3	2	1											
	Lucasium stenodactylus	Sand-plain Gecko	2	5	2	2	1									
	Strophurus ciliaris	Northern Spiny-tailed Gecko				3	1	1								
	Strophurus jeanae	Southern Phasmid Gecko				1										
Elapidae	*Demansia reticulata*	Reticulated Whipsnake	3													
	Demansia rufescens	Rufous Whipsnake		2			1									
	Pseudechis australis	Mulga Snake														1
	Simoselaps anomalus	Desert Banded Snake				2										
Gekkonidae	*Gehyra variegata*	Variegated Dtella	6	1	4		16	28		3						
Pygopodidae	*Delma butleri*	Unbanded Delma	2	1	1	3										
	Delma nasuta	Sharp-snouted Delma					1									
	Delma pax	Peaceful Delma	1													
	Delma tincta	Excitable Delma		1												
Scincidae	*Carlia triacantha*	Desert Rainbow Skink	3	1			1									
	Cryptoblepharus plagiocephalus	Peron's Snake-eyed Skink					2	1								
	Ctenotus duricola	Eastern Pilbara Lined Ctenotus	10	4	1	3	1	3								
	Ctenotus grandis	Grand Ctenotus	4	5	5	3	3	3								
	Ctenotus hanloni	Nimble Ctenotus	1			2	8	9								

Family	Species	Common	BIE001	BIE002	BIE003	BIE004	BIE005	BIE006	BIE007	BIE008	BIE009	BIE010	BP004	BT001-007	BP001-025	Opp001-016
	Ctenotus pantherinus	Leopard Ctenotus	8	2	1	5										
	Ctenotus piankai	Pianka's Ctenotus	1	1												
	Ctenotus rufescens	Rufous Fine-snout Ctenotus	1		5	6										
	Ctenotus saxatilis	Rock Ctenotus	23	6	2	1		4								
	Ctenotus serventyi	North-western Sandy-loam Ctenotus	7	3	10	12	1	4								
	Eremiascincus musivus	Mosaic Desert Skink	2					1								
	Lerista bipes	North-western Sandslider	14	5	30	21	26	9								
	Lerista clara	Sharp-blazed Three-toed Slider					1	1								
	Menetia greyii	Common Dwarf Skink	3	2			2									
	Notoscincus ornatus	Ornate Snake-eyed Skink			1											
	Tiliqua multifasciata	Central Blue-tongue		1	2			1								
Typhlopidae	*Anilios ammodytes*	Sand-diving Blind Snake		1	1											
Varanidae	*Varanus acanthurus*	Spiny-tailed Monitor	1					1								1
	Varanus brevicauda	Short-tailed Pygmy Monitor		2		1										
	Varanus eremius	Pygmy Desert Monitor		2	2	1										
	Varanus gouldii	Sand Monitor			✓			✓								✓
Species richness			**46**	**39**	**42**	**36**	**39**	**49**								

Species records indicate with a tick (✓) indicate the species was recorded but abundance data was not recorded. Systematic sites are highlighted in grey.

Appendix 7 Targetet Bilby transect and plot data

Transect / Plot number	Latitude	Longitude	Number of people	Distance (m)	Presence/absence
BT001			2	12,738.5	
BT002			4	15,069.1	
BT003			4	2,042.3	
BT004			2	7,504.8	
BT005			2	3,015.8	
BT006			4	11,000.7	
BT007			1	1,011.9	
BP001					
BP002					
BP003					
BP004					
BP005					
BP006					
BP007					
BP008					
BP009					
BP0010					
BP011					
BP012					
BP013					
BP014					
BP015					
BP016					
BP017					
BP018					
BP019					
BP020					
BP021					
BP022					
BP023					
BP024					
BP025					

Appendix 8 Maximum and minimum temperatures (°C) and rainfall (mm) recorded at Port Hedland Airport (no. 004032) during the field survey (BoM 2023)

Date (2023)	Max. temp (°C)	Min. temp (°C)	Rainfall (mm)
17 April	31.9	15.6	0
18 April	33.2	16.9	0
19 April	33.6	16.3	0
20 April	32.1	18.4	0
21 April	32.2	21	0
22 April	34.3	19.8	0
23 April	34.6	23.5	0
24 April	32.5	22.1	0
25 April	31.7	22.7	0
26 April	32.5	24.5	0
27 April	32.6	23.9	0
28 April	34.9	22.8	0
29 April	33.5	25.4	0
30 April	31.8	16.4	0